OCTOBER, 1956

Commercial Fertilizer

and PLANT FOOD INDUSTRY

SIXTEEN NITROGEN SOLUTIONS at your service

The trends to granulation and to higher analyses in mixed fertilizers are piling up production problems and bottlenecks as never before. They stress the need for new and improved nitrogen solutions to fit a wide variety of plants and ammoniation procedures.

That is why NITROGEN DIVISION now provides sixteen nitrogen solutions in the most complete line of nitrogen materials on the market. Ever since NITROGEN DIVISION originated the first solutions, research has continued to provide you with the nitrogen materials needed to manufacture better fertilizers at lower cost.

The greatest virtue of bigness is in being able to provide better service to our customers. Our three plants, at Hopewell, Virginia, Ironton, Ohio, and Omaha, Nebraska, can supply nitrogen in the right form to solve your production problems. Our technical men, skilled in production techniques, are always on call for customers. When you have problems, call NITROGEN DIVISION.

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Nitrogen Solutions: NITRANA® • URANA® • U-A-S* • N-DURE*

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Are you good at figures?
EXAMPLE 1
Valve Bags for Granular or Pulverized Materials
If you increased filling production from 12 per minute to 15 or more per minute — without paying a penny more for sleeve or special insert bags... what would be the percentage of increase — and dollar savings to you — per ton — per hour?
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- ☐ We are interested in Example 1.
- ☐ We are interested in Example 2.
- ☐ We are interested in both examples.

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Dependable as a service for 3 generations. Exclusive Sales Agents for the Kraftpacker Automatic Filling Machine and one of the largest integrated producers of multiwall bags with plants in St. Marys, Georgia and Gilman, Vermont, manufacturing every type of multiwall bag in use today!

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There are two big reasons why you should sign *now* with Sinclair for your nitrogen solutions, anhydrous ammonia and aqua ammonia requirements.

First – the completion and opening of a centrally-situated new plant in Hammond, Indiana, means substantial savings on freight charges for most Mid-West nitrogen users.

Second – your seasonal supply problem can be solved by this plant's vast capacity... products will be delivered when you need them to meet *your* production schedule.

Let Sinclair help you solve your nitrogen supply problems and save you money in the bargain. Phone or write...

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75 Third St., N. W., Atlanta 8, Ga.
Phone TRinity 4-4160

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Phone REPUBLIC 1-3050

Address all inquiries, advertising and editorial material, and correspondence to Atlanta Publishing Offices, sending direct to COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, 75 Third St. N. W., Atlanta 8, Georgia.

Vol. 93 No. 4 *Established 1910* October, 1956

Commercial Fertilizer and PLANT FOOD INDUSTRY

Subscription rates: United States, $3.00 per year; 5 years, $12.00. Foreign $5.00 per year.

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COMMERCIAL FERTILIZER and PLANT FOOD INDUSTRY, entered as second class matter, October 12, 1910, at the post office at Atlanta, under the Act of March 3, 1879. Published monthly except semi-monthly in September, by Walter W. Brown Publishing Co., Inc., 75 Third St., N. W., Atlanta 8, Georgia.

Commenting Freely

by Bruce Moran

Reading the papers and listening in on TV and radio we are moved to tears over the plight of the poor farmer who has not yet had the boon of Democratic abundance, and who is suffering from Republican integrity. That is, until you read the lead to an AP story from the mid-West that goes "At the crossroads where the farmers park their shiny cars in long lines down the side roads. . . ."

That word "shiny" is a key word.

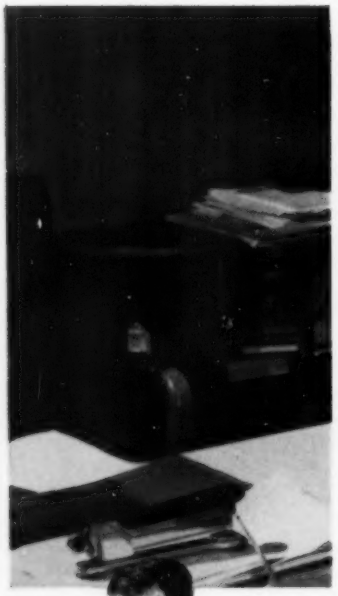
There are suffering farmers, no denying it. And the fertilizer industry would be the last to deny it, because we are experiencing it first hand.

But they are not destitute. In a modest way they are like the men who jumped out of windows because, in 1929, they were down to their last million. But there are a lot of them, and they are more faithful in their voting than city folks. So whatever plight is theirs is the one to which the politicos hitch their troth.

It has always been so . . . and probably always will be. This is the every-fourth-year moon of our national insanity. But it's fun to watch, but you must take it seriously, because it is what makes freedom tick.

When it comes to service, delivery

"It's a pleasure to do business with International"



Mrs. Grace Koos Anderson, *President*
N. S. Koos & Son
Kenosha, Wisconsin

International's triple has excellent condition too. Digs easier than other river barge shipments of triple, says Jack Stolar, Superintendent of the Koos plant . . .

25,000-ton storage capacity of the Koos plant for mixed goods and raw materials. The plant turns out 15 grades, including two speciality lines for lawns and gardens.

An adequate inventory of bagged materials is kept on hand at all times to meet immediate demands from the Koos' three-state sales area. Koos also sells insecticides.

Modern offices, with the original Koos homestead in the background, are the nerve center for Badger Brand fertilizer's sales in Wisconsin, Illinois and Michigan.

and quality of product . . .

MRS. GRACE KOOS ANDERSON looked out the window of her modern, wood-paneled office in Kenosha and said, "The old Koos homestead was right over there. So I guess you can say I really grew up in the fertilizer business."

This background has been paying off handsomely for her today in her management of a thriving 3-state fertilizer and insecticide business. Her wealth of experience and a close attention to details help Mrs. Anderson spot important, cost-cutting differences in service, supply and quality of suppliers.

And here are just two of the ways doing business with International has paid off for her:

Dependability of delivery: "In the many years we have used International, they have never once let us down," she says. This dependability pays off for the Koos plant by helping keep operations on schedule. It helps give them the economy of working out of box cars much of the year, without relying entirely on their 25,000-ton storage capacity. "Cuts handling costs, too."

Shipping service: "We're realizing freight savings right now by using International's barge shipments to Joliet, Illinois, and then by rail to Kenosha ," she says.

Jack Stolar, superintendent of the Koos plant, outlines other advantages of International's triple. Stolar, who has managed two other midwestern fertilizer plants, says, "International, on the whole, has been a better triple than the rest. It digs easier when shipped up in barges and its texture is a little better."

If you have not already tried International's service — and International's superior triple superphosphate — why not put us to the test.

You'll find that International's is the triple with that "something-extra" quality that helps you cut costs . . . gives you better control of manufacturing conditions . . . helps stabilize your formulation problems . . . and will reduce the delivered unit cost of (P_2O_5).

So this year, for a better product and service you can depend upon, look to International Minerals & Chemical Corporation. You'll be glad you did.

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SULPHUR
helps to create headline products

fluoridated
WATER

Some communities will, some won't . . . adopt fluoridation of drinking water for the purpose of reducing tooth decay. The subject is hotly debated but one thing is certain: wherever fluoridation is adopted a derivative of Sulphur will enter the picture.

Several chemicals can be used for fluoridation but they all stem from hydrogen fluoride. To produce this gas, a fluoride-bearing mineral is reacted with sulphuric acid.

As today's Headline Products' are studied, it's significant that so many require for their production one or more derivatives of Sulphur.

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- Newgulf, Texas
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ALL FROM ONE SOURCE:

anhydrous ammonia
fertilizer nitrogen solutions
sulfuric acid
and soon **phosphoric acid**

FROM no other single source can the fertilizer manufacturer obtain the particular combination of essential agricultural chemical raw materials to be available soon from the U.S.I. facilities at Tuscola, Ill.

Anhydrous Ammonia and Fertilizer Nitrogen Solutions. The raw materials for this operation are produced on the spot, insuring that supply is steady, reliable and ample.

Sulfuric Acid. U.S.I.'s 400 ton per day sulfuric acid plant produces all grades of virgin acids, including electrolytic and oleum, plus a good quality of process-spent acid suited to fertilizer manufacture. This plant operates year round, permitting U.S.I. to store during off-seasons for the large in-season demand.

Coming Soon — Phosphoric Acid. U.S.I. is building a new plant at Tuscola to produce wet process phosphoric acid from phosphate rock and U.S.I.'s sulfuric acid. The plant is scheduled to go on-stream by the end of 1956. Design capacity will be 30,000 tons of P_2O_5 shipped as 75% phosphoric acid.

Other Agricultural Chemicals. U.S.I. can supply *special* products on a long term basis, if the demand becomes evident. This because facilities are flexible – integrated with all the manufacturing units at Tuscola which produce a wide variety of chemicals.

In the heart of the midwest farm area, U.S.I. provides one flexible source for fertilizer raw materials—a source organized for prompt service.

For further information, address your nearest U.S.I. office, or contact Chemical Sales, U. S. Industrial Chemicals Co., 99 Park Avenue, New York 16, N. Y.

U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation
99 Park Avenue, New York 16, N. Y.
Branches in principal cities.

JUST AROUND THE CORNER *by Vernon Mount*

STRAWS that break the candidates' backs are not too visible in the separate polls you read in the papers. But if you would set those polls side-by-side in the form of a graph you would soon observe a trend—a narrowing of a lead, or the expanding of a lead. And it is this trend that really helps the forecasters do their crystal-ball reading.

ELECTORAL votes, however, are the final score, the one that pays off. And unless you know how trends are running, state by state, so you can judge what this final score might be . . . don't put your money or your politic-influenced business decisions on the line. You won't have any trouble remembering 1948, I imagine . . . and that is as good a sample as ever happened of how wrong polls may be, and how completely the very best pollsters may be fooled.

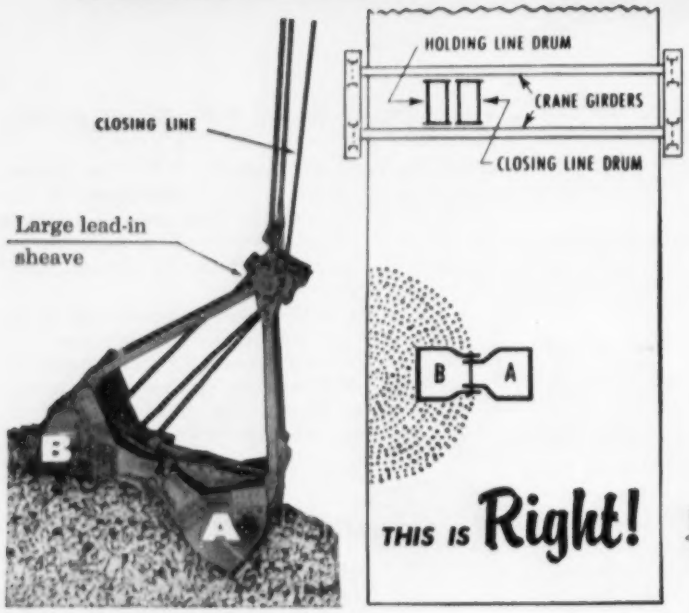
JUST WAIT until November 7, and then begin to trim your sails to what the vote says.

Yours faithfully

Vernon Mount

AMAZING CABLE LIFE INCREASES

reported by leading users of chemical and fertilizer buckets



These increases are the result of applying the practical recommendations, graphically presented with fourteen illustrations of right and wrong bucket applications in Blaw-Knox Bulletin 2510.

This bulletin illustrates and describes proper and improper relationship between:

1. The preferred or required direction of bucket opening.
2. Location and contours of the piles of materials.
3. The position of the holding and closing drums in the overhead crane trolley.

An understanding of this relationship has invariably lead to marked improvement in cable life and bucket performance. Send for your copy of form 2510 today.

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BLAW-KNOX EQUIPMENT DIVISION
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AA QUALITY Ground Phosphate Rock
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Bone Products • Fluosilicates
Ammonium Carbonate • Sulphuric Acid
Insecticides and Fungicides
Phosphoric Acid and Phosphates
Phosphorus and Compounds of Phosphorus

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- Tremendous Production Facilities & Resources
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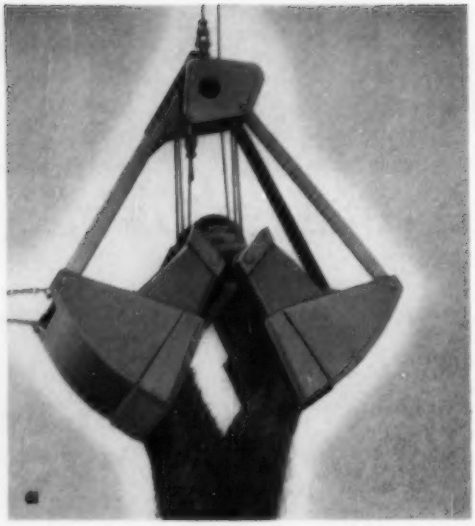
ideas

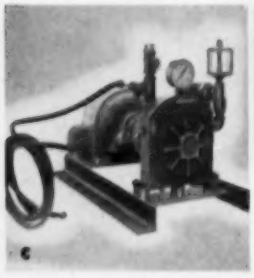
for low-cost bulk-material

- **STORAGE**
- **CHARGING**
- **BATCHING**
- **BLENDING**



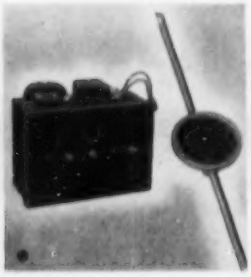
Fertilizer Buckets — To stockpile, load and unload bulk chemicals, fertilizers, and other fine-grained materials, Johnson brings you a special wide-rehandling clamshell bucket. All-welded, fast-filling, clean dumping. Tight closing lips prevent load leakage. Sizes — ⅜ to 3 cu. yds.

Pivoted Distributor directs flow of materials into multiple-compartment bins. Turns and locks into position, controlled from ground level.



Rotary Vane Compressor supplies 7 cu. ft. of air pressure per min. to aerate silos and bins. Limit-relief valve keeps pressure within 15 lbs.

Aeration Fittings for storage silos, bins, keep bulk materials free-flowing. Moisture trap and pressure reducing valve are included.



Bin Gauge Signals accurately indicate high-low level of storage bins, silos. Automatic signal box can be located wherever convenient.

Rotary Plug Valve controls flow of finest materials from silo to screw conveyor. It's also efficient as fill valve on batchers.

Elevator Buckets are all-welded, smooth, fast-filling, quick-dumping. Two types, 8 sizes. Steel chain has all carburized knuckles.

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Nitrogen Solutions Group Meets Oct. 16 at Sioux City

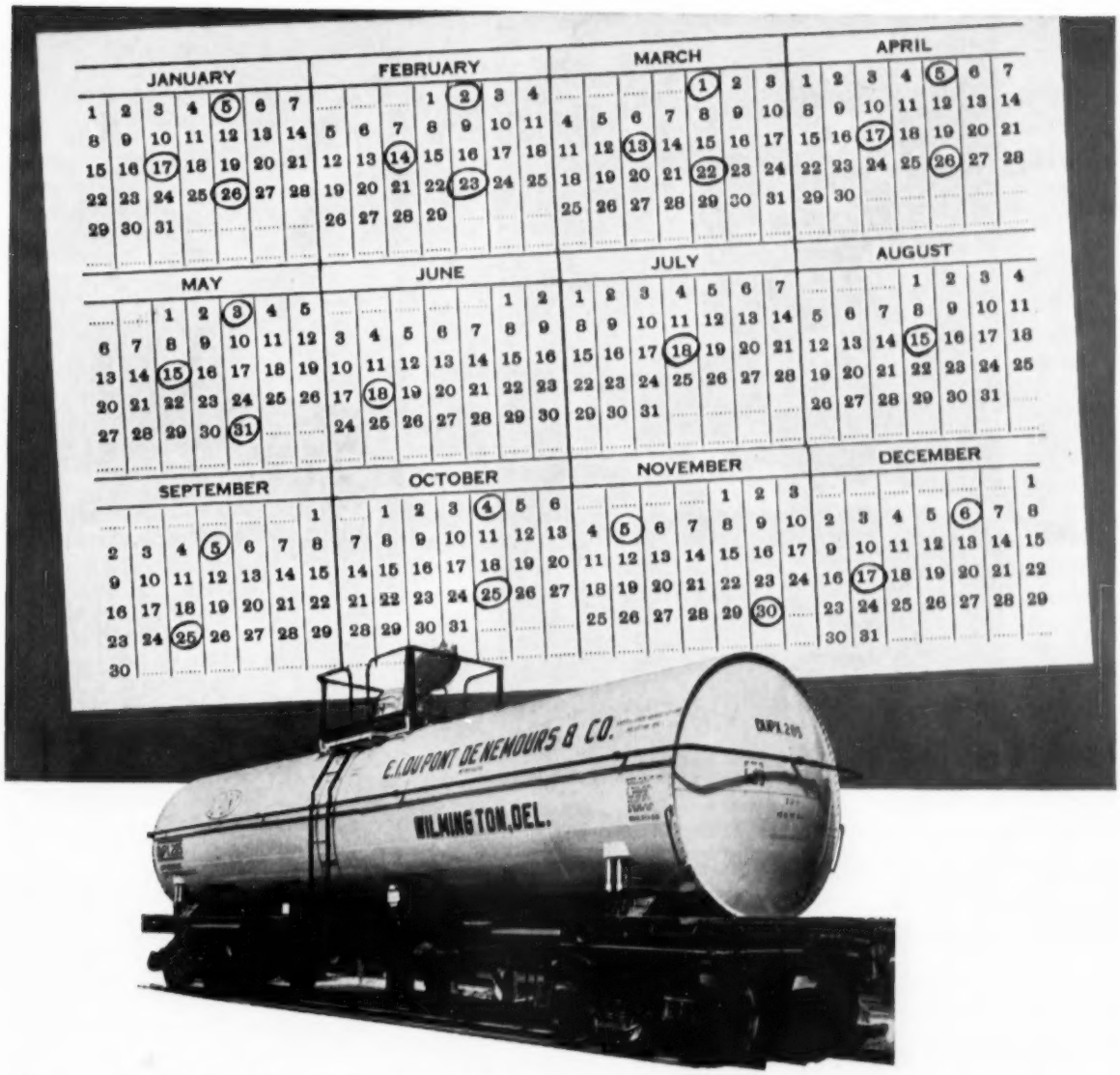
The Annual Meeting and Trade Show of the National Nitrogen Solutions Association will be held at the Sioux City Auditorium, Sioux City, Iowa, October 16 and 17, with the Board of Directors meeting the evening of October 15.

George H. Serviss, G.L.F. Soil Building Service of Ithaca, N. Y., is chairman of the Program Committee, and the 1956 Exhibit is in charge of William B. Spargur, Delavan Manufacturing Co., West DeMoines, Iowa.

The program for the business sessions is built around outstanding speakers, whose subjects are of immediate importance to everyone in the liquid complete fertilizer industry. John D. Waugh, director of advertising for Nitrogen Division of Allied Chemical & Dye Corp., will speak on "Effective Use of Advertising;" Dr. Raoul Allstetter, vice president of National Plant Food Institute has chosen the subject "Production of Fertilizer Nitrogen;" and A. V. Slack, chief of the Program Development Staff, Division of Chemical Development, Tennessee Valley Authority will talk on "Liquid Complete Fertilizers." It is expected that a representative of the Department of Agronomy, Iowa State College of Agriculture and Mechanical Arts will be present to discuss the place of nitrogen in the fertilization of midwestern crops.

The exhibits will be open from 9:00 a.m. to 5:00 p.m. on both days. First session of the annual meeting will be opened at 1:30 p.m., October 16, following luncheon, with a message of welcome by Mayor George Young of Sioux City. President Wayne R. Johnson of Shenandoah, Iowa, will make his official report, followed by Mr. Waugh's presentation. The discussion of the place of nitrogen in the fertilization of midwestern crops is scheduled for the morning session on October 17, with Dr. Allstetter and Mr. Slack appearing on the afternoon program. Each of the principal talks will be followed by a dealer panel discussion, which will be open to all members in attendance.

As a climax to this important meeting, the annual dinner will be held in the evening of Wednesday, October 17, to be followed by a very unusual program of entertainment.



Schedule your production with confidence— Du Pont **URAMON**® Ammonia Liquors arrive on time

When you order Du Pont UAL, you can depend upon prompt delivery, regardless of the time of year. This dependable service assures you smooth, economical plant operation.

There are four formulations available, including UAL 37, a special composition that provides slowly available nitrogen. For technical assistance and information on the solution best suited to your use, write Du Pont.

Works Well in Granulation—UAL is safe in the granulator, even with concentrated acids; gives hard, uniform, stable granules, best for storage, application.

Flexibility—UAL can be readily used for either batch or continuous mixing.

Excellent Conditioning—UAL speeds curing, gives mixed goods better "feel"—minimizes caking, segregation and dusting.

Non-Corrosive—UAL can be used in any normal fertilizer manufacturing equipment including ordinary steel. (The mild steel tank car shown above has carried UAL for 23 years.)

High-Quality Nitrogen—UAL furnishes nitrogen of superior agronomic value. Resists leaching, has the advantages of both urea and ammonia nitrogen.

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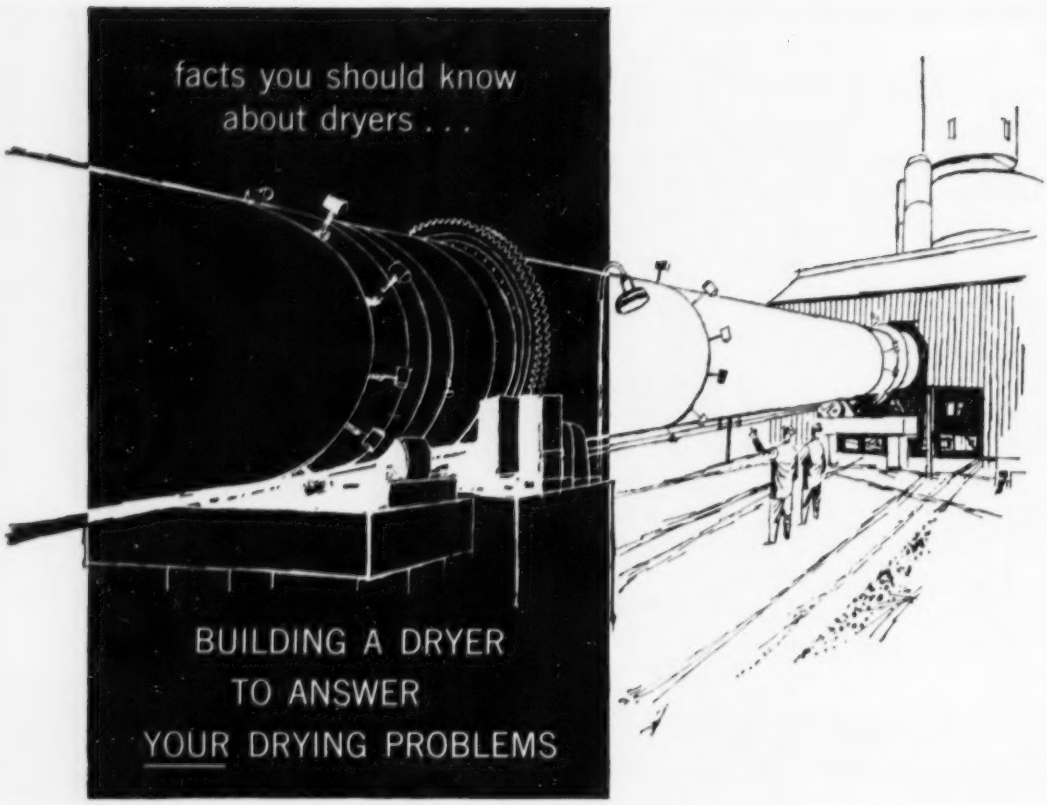

For over 55 years, Louisville Dryers have been solving industry's drying problems and effecting marked economies. The following is intended as an introduction to selecting the right type of dryer.

Q. *Since my required production capacity indicates a continuous dryer will give lowest drying cost, which design is best for my purpose?*

A. Assuming the material is in bulk form, a rotary type dryer is best for your purpose. It is almost axiomatic that materials suited to drying in rotary dryers are dried at lowest *overall* cost in that type.

Q. *If I consider a rotary dryer, should it use high temperature furnace gases or low temperature warm air to dry my material?*

A. This will depend on your particular material, for instance—

1. The temperature to which it can be heated without injury.
2. The amount of moisture in the wet material.
3. The material temperature necessary to dry the material to the desired final moisture content.
4. Whether or not the material will be contaminated by contact with combustion gases.

Q. *I think my material will not be injured by gases from an oil furnace. Should I use a parallel or counter current rotary dryer?*

A. This will depend on a number of considerations, such as:—

1. Is the material flammable?
2. How dry must the product be?
3. Is the dried product dusty or is it granular with very small percentage of "fines?"
4. Will "case hardening" occur in high temperature atmosphere inhibiting uniform and complete drying of large lumps and particles?

Q. *There seems to be quite a number of conditions affecting the selection of the proper dryer type.*

A. Very true. And the conditions involved are not all included in the above discussion by any means.

Q. *How can I be sure of making the proper choice?*

A. An experienced drying engineer knows how to evaluate the various conditions involved in each drying problem and will make a sensible recommendation. If advisable he will also recommend pilot plant tests to confirm his conclusions.

Q. *How can I obtain such advice?*

A. Submit your problem to General American. An analysis and recommendation by a LOUISVILLE engineer entails no obligation on your part.

PROCESS EQUIPMENT DIVISION
GENERAL AMERICAN
TRADE MARK

LOUISVILLE DRYING MACHINERY UNIT

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Eastern Sales Office: 380 Madison Avenue, New York 17, New York
In Canada: Canadian Locomotive Company, Ltd., Kingston, Ontario, Canada
General Offices: 135 S. La Salle Street, Chicago 90, Illinois

Butz To Speak To Midwest Soil Group

Earl L. Butz, assistant secretary of agriculture, will discuss "The Implications of the Soil Bank to the Fertilizer Industry" at the annual meeting of the Middle West Soil Improvement Committee, Oct. 25, at the Sherman Hotel, Chicago, it was announced by Z. H. Beers, MWSIC executive secretary.

Mr. Butz's address is scheduled for 10 a.m. The morning program preceding and following his address will be devoted to the annual MWSIC business meeting at which reports will be presented on the results of the committee's 1955-56 educational program. Plans will be formulated for new activities during the coming year.

Pacific Northwest Dealers' Day Meetings

Two Dealers' Days were scheduled for October 2 and 3, 1956—the first at Mt. Vernon, Washington, and the second on the following day at Prosser, Washington.

Dealers' Day in Oregon will be held about the middle of January 1957; the exact date to be set shortly.

The success of these two days depend to a large extent on the cooperation given by the Mixed Fertilizer Manufacturers and the Association members. Program for the two days is enclosed. Through your salesmen contacting the dealer trade, sufficient momentum should be generated to make these two a success.

Make your hotel reservations at Harrison Hot Springs immediately. You should plan on arriving the evening of November 7, and departing on the morning of the 10th. The Annual Banquet will be Friday evening, the 9th. Consolidated Mining and Smelting Company of Canada Limited will be hosts at the Cocktail Hour prior to the banquet. Ray Whitcomb, of Bleyhl's, Inc., of Grandview, Washington, has been appointed Raffle Committee Chairman.

Maine Bankers Issue Fertile Fields Brochure

The Maine Bankers Association, in cooperation with the University of Maine and the National Plant Food Institute, has produced a 16-page brochure on "More Profits from Fertile Fields."

The brochure has a prefacing statement by Dean of Agriculture A. L. Deering, of the University of

MURIATE OF POTASH for the PLANT FOOD INDUSTRY

THIS symbol stands for high-grade coarse and uniform Muriate of Potash (60% K_2O minimum). Southwest Potash Corporation provides a dependable supply of HIGH-K* Muriate for the plant food industry.

*Trade Mark

Southwest Potash Corporation

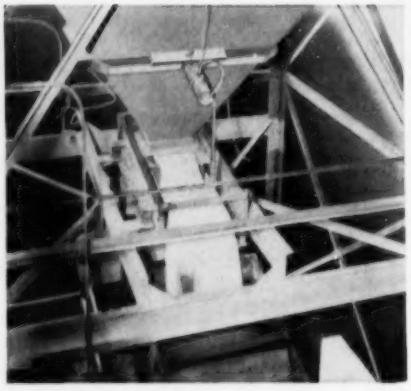
61 BROADWAY * NEW YORK 6, N. Y.

TWO TOOLS

that bring further automation to *your fertilizer production*

Handling super phosphate or other fertilizer ingredients, Simplicity Gyrating Screens combine positive action with perfect smoothness to increase your output. Simplicity Gyrating Screens are mechanically vibrated, using a counterbalanced eccentric shaft which exactly counterbalances the weight of the entire deck assembly. A 3′ x 8′ Model LS Simplicity Single Deck Screen can handle as much as 50 tons of super phosphate per hour, with virtually no blinding of the screen, and a 3′ x 6′ Simplicity Model C can handle all other fertilizer ingredients at about the same speed. Every Simplicity Screen has the actual available screening area indicated by the given dimensions.

Simplicity Os-A-Veyor Feeders can be bin-hung, as shown in the photograph, or may be spring mounted. The Os-A-Veyor feeds along its entire length and allows for the use of a larger bin, thus avoiding bridging in the bin. Simplicity Os-A-Veyor Feeders have replaceable liners and can be provided with grizzly or screen sections, one or two decks, and can be totally enclosed. Simplicity Os-A-Veyor Feeders are doing a fast, efficient job for fertilizer plants throughout America.



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Maine, who points out that: "A prosperous agriculture for any area is dependent upon having a group of well informed people using, with intelligence, the available soil resources within the natural limitations imposed by weather."

Sou. Weed Conference Augusta, Jan. 23-25

Latest developments in the use of chemicals to control weeds in all phases of Southern agriculture will be featured during the 10th annual meeting of the Southern Weed Conference scheduled to be held in Augusta, Georgia, January 23-25, 1957 at the Bon Aire Hotel.

All phases of research and education in chemical weed control will be reviewed according to Dr. W. B. Albert of the South Carolina Agricultural Experiment Station, Clemson, South Carolina, conference president.

A complete program is now being prepared and will be announced prior to the conference. Dr. J. K. Leasure of the Dow Chemical Company, Midland, Michigan, is serving as chairman of the program committee for this conference.

Officers for the 10th annual conference are: president, Dr. W. B. Albert; vice president, Dr. E. G. Rodgers of the University of Florida, Gainesville, Florida; and secretary-treasurer, Dr. Walter K. Porter, Louisiana State University, Baton Rouge, Louisiana.

All sessions of the conference will be held at the Bon Aire Hotel in Augusta, Georgia. Conferees are expected to reserve their own hotel accommodations.

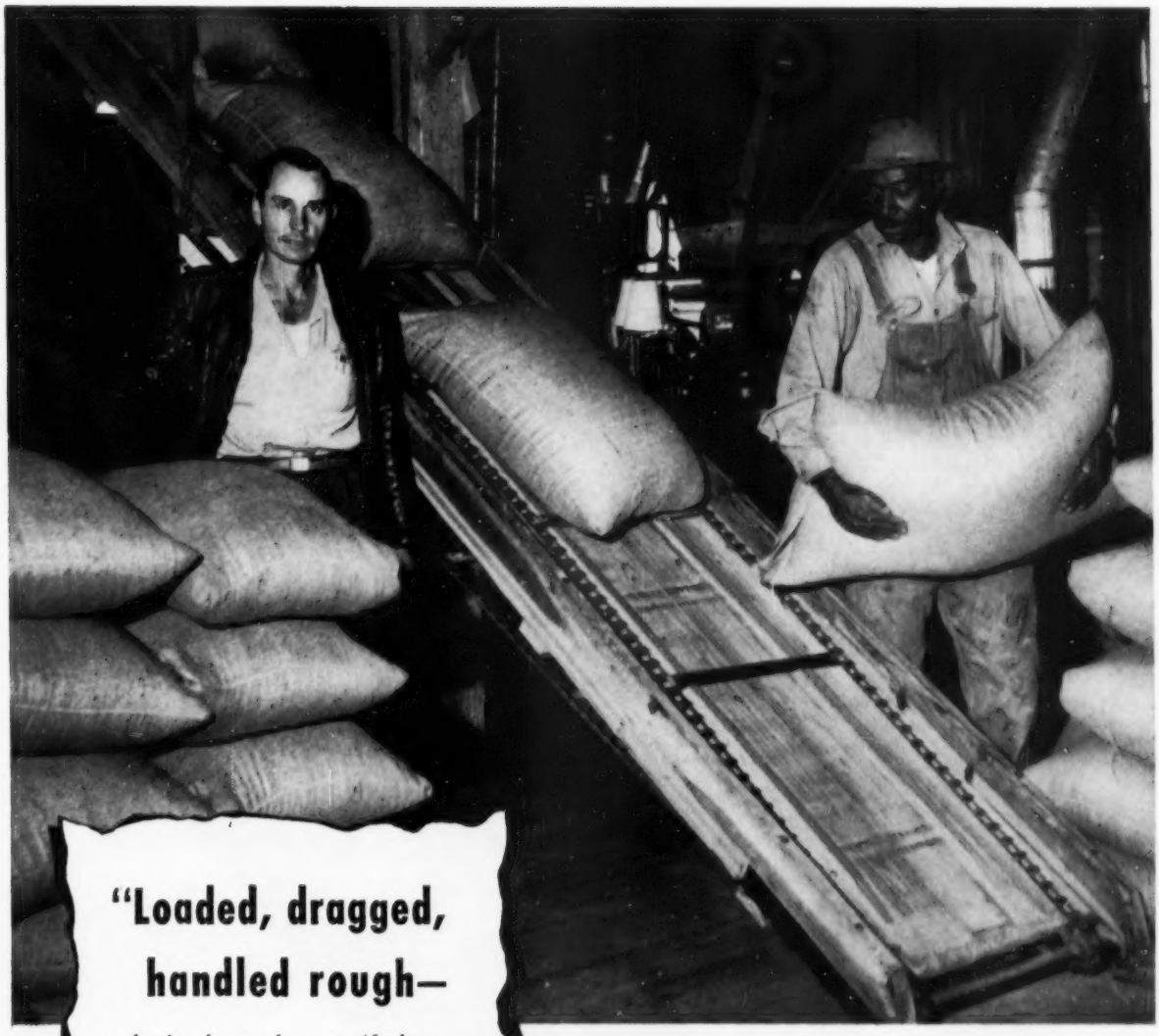
Cotton Conference December 13-14

The latest experimental results in various phases of cotton production will be highlighted at the second annual Beltwide Cotton Production Conference at the Tutwiler in Birmingham, December 13 and 14.

The conference is sponsored by the National Cotton Council in cooperation with Cotton Belt land grant colleges, USDA, agricultural chemical industry, farm organizations, and others.

Program for the meeting will bring into sharp focus the latest experimental results on insect and disease control, chemical weed control, fertilization, defoliation, and other phases of cotton production.

The production conference will be preceded by meetings of a number of technical groups.



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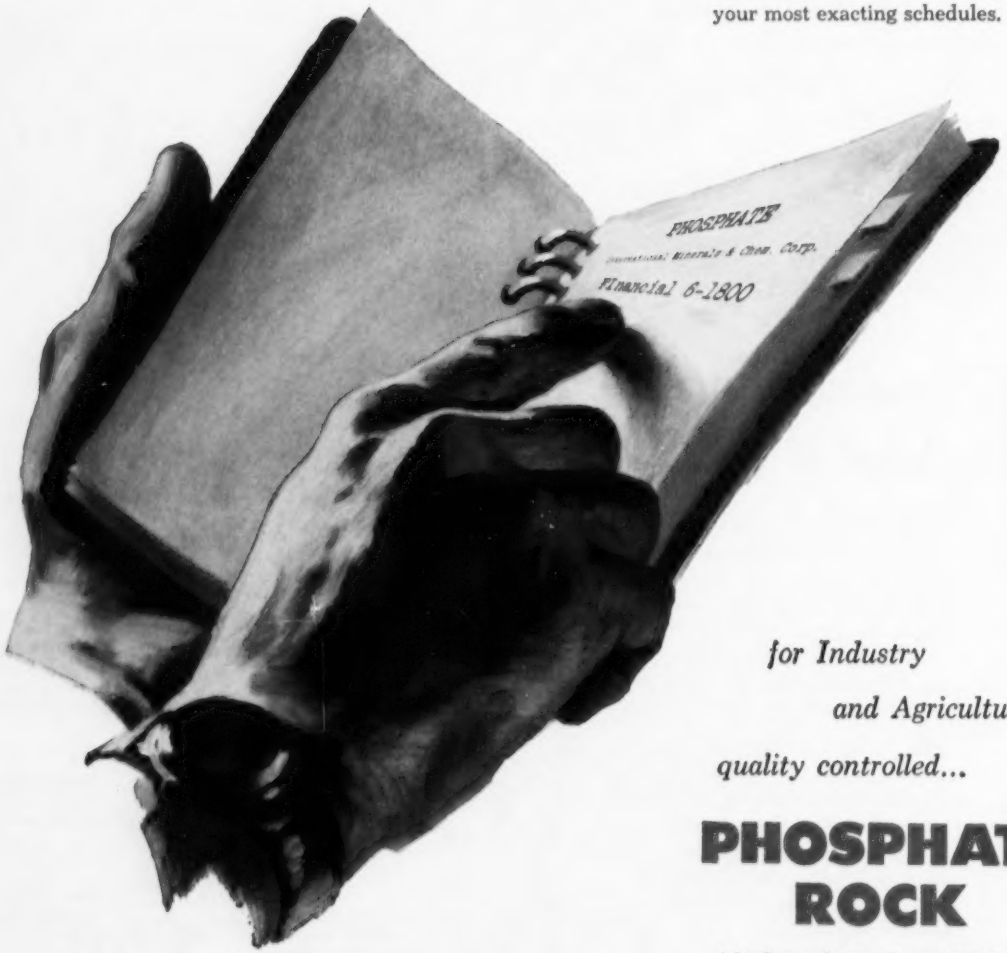

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CFA READY WITH SIZZLE FOR NOVEMBER 11 - 13

Elmer Wheeler of the Sizzle Ranch, Dallas, Texas, one of America's leading authorities on sales management, will be featured at the Thirty-third Annual Convention of the California Fertilizer Association to be held at Hotel del Coronado, Coronado, on November 11, 12, and 13. About 600 will attend from all portions of the United States and from Canada as well.

Wheeler originated the well-known phrase "don't sell the steak, sell the sizzle," and he will tell the plant food people assembled at Coronado about "Selling the Sizzle in the Fertilizer Business." He has originated many highly successful sales approaches for many different businesses, according to Frank Scoville, Chula Vista, Convention Chairman.

Four directors will be chosen to serve during the coming three years, and new officers elected to serve during 1957. Other business will be action on a proposed revision of the Constitution and By-Laws; on the 1957 budget; and reports on the program of the Association's technical committee, that on Soil Improvement, and on a new fertilizer use brochure for bankers and farmers.

To round out the theme for this year's convention — "Some Aspects of Fertilizer Industry Economics"— Scoville has obtained for the program Professor Philip Neff, Director, Industrial and Governmental Economics Research of the Planning Research Corporation, Westwood, California. A panel discussion on the subject of the convention theme will wind up the business portion of the program. Dr. Daniel G. Aldrich, Jr., Chairman of the Department of Soils and Plant Nutrition, University of California, Davis, will moderate the panel discussion.

Scoville reports that an outstanding program of entertainment and recreation has been developed for the ladies, who will be guests of the Association at a cocktail hour and luncheon at the La Jolla Beach and Tennis Club, La Jolla. Golf tournaments for men and for women; two ladies' putting contests — one for golfers and the other for non-golfers; bowling; bridge and canasta will have their places on the program, with prizes to be awarded at the Banquet.

Delightful social events to be sponsored by member concerns will include a cocktail hour and buffet dinner by Stauffer Chemical Company and Western Phosphates, Inc., on Sunday, November 11. On November 12, a cocktail hour by Balfour, Guthrie & Co., Limited, followed by a steak dinner, courtesy of Shell Chemical Corporation. On Tuesday, November 13, the annual banquet will be preceeded by a cocktail hour sponsored by American Potash and Chemical Corporation.

* * *

The Board of Directors of the California Fertilizer Association has been brought to full strength by its recent action of electing three persons to fill vacancies which have existed. The three new Board members are Lowell W. Berry, President, The Best Fertilizers Company, Oakland; Arthur W. Mohr, President, California Spray-Chemical Corporation, Richmond; and John N. Williams, President, General Fertilizer & Supply Company, Chula Vista. The complete Board is now made up of: John C. Anderson, The Agriform Company, Bakersfield; Jack Baker, Bandini Fertilizer Company, Los Angeles; Lowell W. Berry, The Best Fertilizers Company, Oakland; Fred R. Bryant, Brown & Bryant, Shafter; Virgil A. Frizzell, The Triangle Company, Salinas; Howard H. Hawkins, Golden State Plant Food Company, Glendora; Wm. G. Hewitt, Pacific Guano Company, Berkeley; B. H. Jones, Sunland Industries, Inc., Fresno; Arthur W. Mohr, California Spray-Chemical Corp., Richmond; Wm. E. Snyder, Wilbur-Ellis Company, Los Angeles; M. M. Stockman, The Mountain Copper Company, San Francisco; John N. Williams, General Fertilizer & Supply Co., Chula Vista.

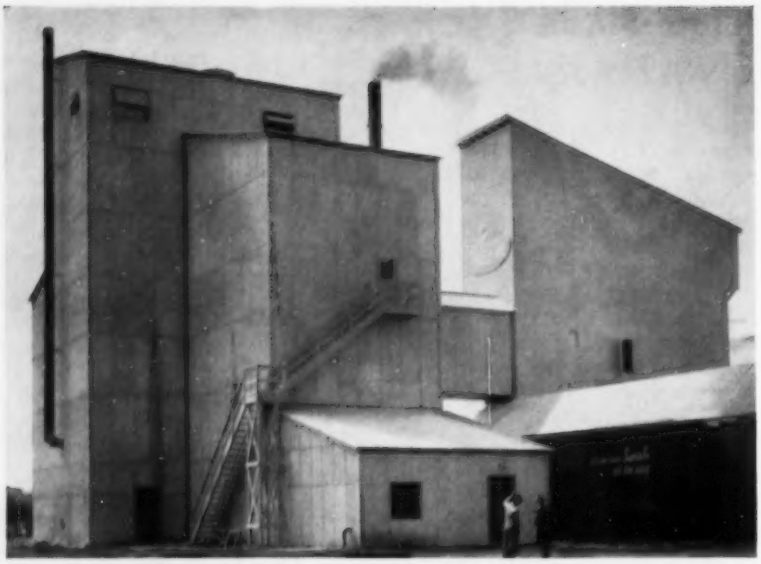
Association officers are: Wm. E. Snyder, President; Jack Baker, Vice President; Howard H. Hawkins, Secretary; Wm. G. Hewitt, Treasurer; Sidney H. Bierly, Executive Secretary and Manager.

FIRST SOUTHERN FERTILITY CONFERENCE NOVEMBER 2

The first annual Southern soil fertility conference has been scheduled for November 2, at the Biltmore Hotel, Atlanta, Ga. Sponsored jointly by the Southern Regional Soil Research Committee and the National Plant Food Institute. The Committee is composed of one soil scientist from each of the 13 Southern land-grant colleges and universities, plus soil scientists from the Agricultural Research Service and the Soil Conservation Service of USDA.

Officers are H. T. Rogers, Chairman; W. E. Colwell, Directors' Representative; R. W. Pearson, Secretary. The conference was planned under the direction of the Program Committee, which included: J. W. Fitts, North Carolina State College; W. R. Paden, Clemson Agricultural College; R. W. Pearson, U. S. Department of Agriculture and Alabama Polytechnic Institute; C. M. Wilson, Alabama Polytechnic Institute; T. F. Bridgers, Farmers Cotton Oil Company; H. Vise Miller, Armour Fertilizer Works; W. F. Nichols; Sylacauga Fertilizer Company; W. H. Garman, Chairman National Plant Food Institute.

The program they have developed follows: Thursday, November 1— Regisration begins 3:00 P.M.; Friday morning, November 2 — Presiding: Howard T. Rogers, Head, Department of Agronomy and Soils, Alabama Polytechnic Institute; 9:30 A.M., Opening remarks, W. E. Colwell, Assistant Director of Research, North Carolina State College; C. T. Prindeville, President, National Plant Food Institute. 9:45 A.M., Off-season Fertilizer Potentials in the South, L. B. Nelson, Head, Eastern Soil and Water Management Section, U. S. Department of Agriculture. 10:30 A.M., Recess. 10:45 A.M., Two Acres of Pasture on One Acre of Land, W. R. Thompson, Pasture Specialist, Mississippi State College. 11:30 A.M., Luncheon Recess. Friday Afternoon, November 2— Presiding, W. E. Colwell, Assistant Director of Research, North Carolina State College. 2:00 P.M.,Fertilizing and Liming for Most Efficient Crop and Livestock Production, M. S. Williams, Chief Agricultural Economist, National Plant Food Institute. 2:45 P.M., Grade-Ratio Committee Report, J. W. Fitts, Head, Department of Soils, North Carolina State College, and Frank Boyd, President, Alabama Soil Fertility Society. 3:30 P.M., Question and Answer Period, W. E. Colwell, Moderator.



This three-story structure houses all of the Link-Belt equipment used in the manufacture of high-analysis granulated fertilizer at Federal Chemical Company, Danville, Illinois.

Data and pictures courtesy Link-Belt Company.

FEDERAL ADDS THIRD GRANULATING PLANT

Federal Chemical Company has recently added a third granulating plant for the manufacture of high-analysis granulated fertilizer. Federal's newest granulation plant at Danville, Illinois, was designed and equipped by Link-Belt Company. Typical fertilizer grades being manufactured at the Danville installation are: 10-10-10, 12-12-12, and 4-16-16.

The Danville plant complements Federal's granulated fertilizer facilities at Columbus, Ohio, and Nashville, Tennessee. In addition, Federal Chemical operates plants for manufacturing conventional type fertilizer at Louisville, Kentucky; Butler, Indiana; and Humboldt, Tennessee.

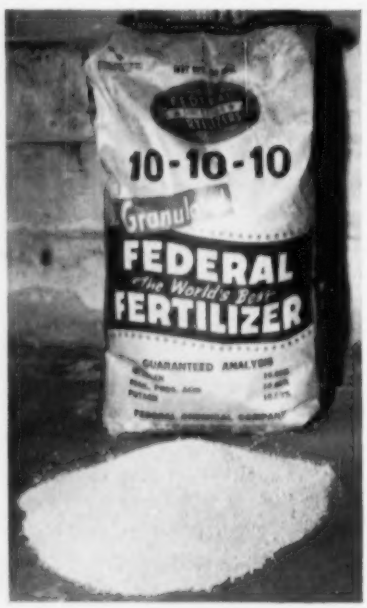
A description of the Link-Belt designed plant can be divided into the following process steps: ammoniation, granulation, drying-cooling, and screening.

Ammoniation

Normal strength or triple superphosphate and potash are delivered from a batch mixer to the granulating plant on a 20-in. wide, 70-ft. horizontal centers, belt conveyor. This material goes to a surge hopper by means of a 16 by 8-in. centrifugal discharge elevator (45-ft. vertical centers). From the hopper, the material is gravimetrically fed by a 18-in. Merchen scale feeder into a continuous ammoniator where sulfuric acid, anhydrous ammonia and/or nitrogen solutions are mixed with the superphosphate and potash.

The underlying principle of the ammoniator is based upon the introduction of the ammoniating medium and acid, as needed, under the rolling bed of dry materials. The continuous ammoniator, which Link-Belt Company is licensed to build, consists of a rotating cylinder with retaining rings at each end. The ammoniating medium is fed beneath the rolling bed of solids by a multiple-outlet, slit-type distributor. The mechanical action of this equipment promotes agglomeration under favorable conditions of the liquid and solids content and the temperature of the rolling bed of materials.

Inside this 80-lb. bag is granulated fertilizer like the sample spread in the foreground. The fertilizer is free-flowing, a quality demanded by customers because the material will pass through fertilizer spreader drills without clogging.



Process controls are provided to record, integrate, and control the amounts of nitrogen solution, anhydrous ammonia, and water fed into the continuous ammoniator.

Granulation

The material from the ammoniator discharges by gravity to a Link-Belt Roto-Granulator on the floor below. The Roto-Granulator is a cylindrical steel shell 7½ft. in diameter and 15 ft. long which rotates on an axis inclined approximately two degrees from the horizontal. The revolving action of this unit causes the moist material to form into pellets.

Drying-Cooling

By gravity flow, the pelletized fertilizer discharges to a Roto-Louvre dryer-cooler on the ground floor. This dryer-cooler is 11½ ft. in diameter and 42 ft. long.

The Roto-Louvre dryer-cooler was selected for this job because it can perform the drying and cooling operation in one unit—reducing the number of pieces of equipment necessary and the floor space requirements. The manner by which the heating and cooling air is introduced into the materials tends to improve granulation and eliminate degradation. By applying simple controls, uniform temperatures and moisture content of the material is accom-

plished effectively.

The Roto-Louvre is controlled from a remote panel where inlet air temperature, exhaust air temperature, and material temperature are recorded on circular charts. The control panel enables the operator at the ammoniator to check conditions at the dryer-cooler which is located two floors below the ammoniator.

Screening

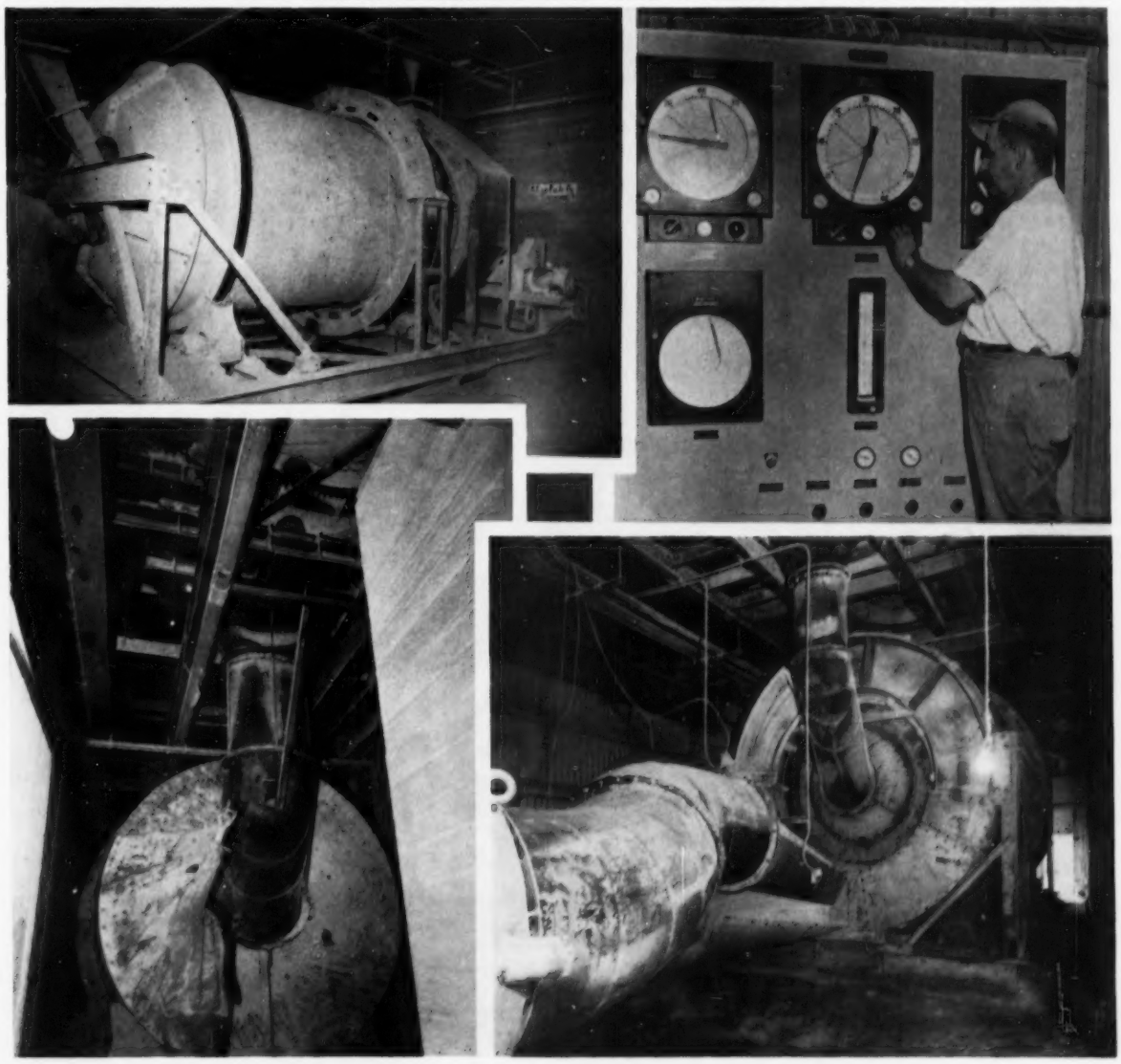
The granulated fertilizer discharges from the Roto-Louvre dryer-cooler to a 20 in. wide, 26 ft. horizontal centers, troughing belt conveyor which carries the product to a 16 by 8-in. centrifugal bucket elevator on 65 ft. vertical centers. The elevator discharges to a CA 2614 double-deck vibrating screen which screens 6-mesh and 28-mesh equivalent product.

Oversize material goes to a squirrel cage crusher and back onto the finished product belt conveyor. The fines are conveyed by a 14 by 7-in., 45 ft. vertical centers, centrifugal discharge bucket elevator to a storage hopper. The amount of fines recycled to the ammoniator is one of the methods used to control the rate of granulation and the particle size.

A Link-Belt P.I.V. drive regulates the speed of the recycle fines feeder belt as fines are recycled to the ammoniator. The P.I.V. is remotely controlled by a fractional horsepower motor which changes settings in response to a signal from the ammoniating station.

After the granulated fertilizer has been screened, it discharges to a 20 in. wide, 100 ft. horizontal centers, troughing belt conveyor which carries the finished product to storage bins in the main fertilizer plant.

Top left: Continuous ammoniator built by Link-Belt mixes anhydrous ammonia, nitrogen solutions, and sulfuric acid with dry bed of superphosphate and potash. This is the first step in the manufacture of high-analysis granulated fertilizer. Man at left is taking sample.
Top right: The recorder-controller panel at the ammoniating station registers inlet air temperature, exhaust air temperature and material temperature in the Roto-Louvre dryer-cooler two floors below. Plant manager John Langsford is checking the dryer air exhaust temperature.
Bottom left: Ammoniated material discharges by gravity from the continuous ammoniator to this Link-Belt Roto-Granulator. This unit is a revolving cylindrical steel shell 7½ ft. in diameter by 15 ft. long. Here the moist fertilizer ingredients are rolled into pellets.
Bottom right: This huge Roto-Louvre dryer-cooler is 11½ ft. in diameter by 42 ft. long. Granulated fertilizer from the Roto-Granulator on the floor above discharges by gravity into this unit. Circular ducts entering the bottom of the Roto-Louvre carry heating and cooling air into the unit.



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TREES—A NEW MARKET FOR YOU

Fertilizer applications to forests may open up a whole new market for the fertilizer manufacturer. Now faced with decreasing sales of fertilizer to the farmer, manufacturers may see forest application sales numbering in the thousands of tons in the next decade. Intensive investigation and proof of fertilizer's efficacy in the forest is now under way to develop this market potential.

Aerial application of a complete fertilizer to forest trees has been made at the Rutgers University Dairy Research Farm at Beemerville, N. J., by the Rutgers Forestry Department and Nitrogen Division, Allied Chemical & Dye Corporation. It is believed to be the first such application ever made.

The fertilizer was spread over an 11-acre stand of red pine.

The purpose of the experiment is to improve the growth of the 28-year-old trees that are growing slowly because of low fertility soil, according to John Andresen of the State University Forestry Department.

Fertilizing of trees to get a greater volume of wood quicker is an entirely new concept in the U. S., although it has been practiced for some time in Europe where there has been a shortage of wood for centuries.

Recent tests of fertilizing trees have indicated increases in growth ranging from 40 to 65 percent. Current, larger-scale work is directed toward improvement of the fertilizing technique, which in practice could lead to more abundant, cheaper wood for the pulp and paper industries.

The fertilizer applied at Beemerville was a standard agricultural material with an analysis of 12 percent nitrogen, 12 percent phosphorus and 12 percent potash, the three primary plant foods. A crop-dusting Stearman airplane operated by Cherry Dusting Service of Pemberton applied the material at the rate of 400 pounds an acre in a spreading time of 6 minutes.

Measurements of the fertilized trees will be made after each growing season to determine the extent of their response to the fertilizer.

Stearman crop-dusting plane is applying 12-12-12 fertilizer at the rate of 400 pounds an acre to forest stand at the Rutgers University Dairy Research Farm, Beemerville, N. J.

Other experiments have shown that well fertilized trees are greener, have longer needles and are more healthy in general than trees growing without sufficient plant food.

Recently expanded pulp and paper production facilities are expected to put an even heavier drain on the Southeastern pine forests which now provide the bulk of pulpwood. Fertilization of these stands is expected to provide the key to greater volume as it did to agricultural crop production.

The new practice of forest fertilization will have an impact on various industries and national resources. Following notes indicate how various groups may be affected.

Farm Woodlot—Aerial fertilization might well prove to be a boon and an efficient tool in the hands of the farm woodlot owner. Farmers own 34 percent of all the forest land in the United States. Volume production of slow-growing woodlots may be increased in three-quarters of the time heretofore realized.

Conservation and Wildlife — The Beemerville tests showed that forests inaccessible to ground travel may now be fertilized by airplane. As plant foods are applied and tree and ground cover growth increases, there will be improvement and conservation of forest soils, and food and cover for wildlife will be increased . . . good news for hunters.

Aviation — These tests indicate that aerial fertilizer application to forests is economically within reason to custom applicators. Fertilization from the air on annual agricultural crops is not a new idea, but this is the first time it has been tried on forest land. Application is less hazardous, easier than in crop dusting and crop fertilization. It is anticipated that operating costs will drop as high payload plans are put into the air. More business for custom applicators will develop.

EXPANDING FERTILIZER MARKET SEEN

At the ACS meeting in Atlantic City last month Dr. Byron T. Shaw, Administrator, Agricultural Research Service, U.S.D.A., predicted strong sales growth ahead for the fertilizer industry. He forecast that by 1975 consumption of plant nutrients in fertilizers will reach a level of 10-12 million tons, or an increase of 75 to 100 per cent over current use; anticipated no striking alterations that would reduce demand for fertilizers in the next 20 years.

USE OF DIAMMONIUM PHOSPHATE IN PRODUCTION OF GRANULAR, HIGH-ANALYSIS FERTILIZERS

By
T. P. Hignett, G. C. Hicks, and J. E. Jordan
Tennessee Valley Authority, Wilson Dam, Alabama

The use of diammonium phosphate in production of granular, high-analysis fertilizers may be of interest to fertilizer manufacturers because it offers the following advantages:

1. Higher analysis products can be made with diammonium phosphate than are possible with conventional raw materials.
2. Diammonium phosphate contributes water-soluble P_2O_5, thereby increasing the water solubility of the products.
3. Inclusion of diammonium phosphate decreases the amount of ammoniator reactions that would otherwise be required. This may be an advantage in making some high-analysis grades in which conventional formulations may involve more heat of reaction than is desirable for good granulation.
4. Substituting diammonium phosphate for equivalent amounts of nitrogen solution and superphosphate lowers the moisture content of the formulation. This is an advantage when the moisture content is higher than is needed for granulation. The advantage of lower moisture content may result in economies in drying the granular product, and it may facilitate higher production rates in plants of limited drying capacity.

Pilot-Plant Studies

A series of tests were made in the TVA ammoniation-granulation pilot plant. The pilot plant and the operating procedure have been described in a paper titled "Granulation of High-Analysis Fertilizers" by Hein, Hicks, Silverberg, and Seatz, which was published in the April 1956 issue of "Journal of Agricultural and Food Chemistry."*

**Reprinted in Commercial Fertilizer and Plant Food Industry's 1956 Year Book (September, 1956).*

Table I: Pilot-Plant Data for Granulation of Mixed Fertilizers Containing Diammonium Phosphate

Run No.	2	9	3	4	8-B	10-A	7	12
Grade	12-24-12	13-39-0	13-39-0	16-20-0	8-24-24	20-20-0	15-30-0	10-30-20
Production rate, tons/hr.	1	3	3	2	3	2	2	2
Formulation, lb./ton product								
Diammonium phosphate	150	550	334	465	472	550	354	601
Concentrated superphosphate	863	1080	1232	---	506	246	935	586
Ordinary superphosphate	---	---	---	803	---	---	---	---
Potassium chloride	422	---	---	---	748	---	---	648
Nitrogen solution X*	520	238	430	470	91	350	547	135
Ammonia (anhydrous liquid)	---	65	---	---	38	---	---	25
Ammonium sulfate	---	---	---	194	---	748	153	---
Sulfuric acid (66° Be.)	105	109	---	174	104	167	109	---
Subtotal	2060	2042	1996	2106	1959	2061	2098	1995
Water	---	26	---	45	94	---	---	26
Steam	---	---	29	---	---	---	---	90
Recycle	458	262	381	388	307	284	470	424
Air, cu. ft./ton product	9000	---	---	---	---	1100	---	---
Lb. NH_3 fed/unit available P_2O_5 in superphosphates	4.3	3.1	3.3	5.4	1.9	3.6	3.6	3.7
Artificially dried (?)	No	No	No	Yes	No	Yes	No	Yes
Moisture, %								
Input to ammoniator	4.3	5.1	5.9	6.8	5.9	2.9	5.0	5.7
Ammoniator product	3.6	4.8	7.0	4.0	5.1	1.8	4.0	3.4
Granulator product	3.5	4.8	6.5	3.8	5.0	1.5	3.9	3.1
Dryer or cooler product	2.7	3.1	4.4	1.1	3.6	0.5	3.1	1.4
Temperature, °F.								
Ammoniator product	184	216	186	201	184	193	202	197
Granulator product	173	203	177	187	171	180	189	179
Dryer or cooler product	79	120	88	186	85	200	128	195
Losses, %								
Free NH_3, by gas analysis	2.9	5.8	0.2	2.8	0.6	8.2	1.2	3.3
P_2O_5 availability (in superphosphates)	2.1	1.1	1.8	1.6	0.9	0	0.7	1.8
Screen analysis, %								
Granulator product								
Oversize (+6 mesh)	62.8	52.4	53.1	34.7	37.3	58.8	50.8	23.0
Onsize (—6 +28 mesh)	35.9	45.8	45.5	61.3	60.3	41.0	48.4	77.0
Undersize (—28 mesh)	1.3	1.8	1.4	4.0	2.4	0.2	0.8	0
Cooler or dryer product								
Oversize (+6 mesh)	47.0	67.1	30.4	33.0	37.4	63.2	31.3	10.0
Onsize (—6 +28 mesh)	52.2	32.6	61.7	63.9	58.9	36.1	66.7	89.8
Undersize (—28 mesh)	0.8	0.3	7.9	3.1	3.7	0.7	2.0	0.2
Onsize material after crushing oversize	89	83	85	89	87	84	90	97
Chemical analysis of product (—6 +28 mesh), %								
Total N	12.2	13.1	12.5	15.9	8.1	20.3	15.8	10.1
NH_3-N	9.2	11.6	9.8	13.1	7.7	18.4	13.0	9.0
Total P_2O_5	25.4	42.7	39.4	20.8	25.9	22.1	33.6	31.5
Available P_2O_5	24.0	41.8	37.6	20.5	25.5	22.0	33.2	31.2
Water Soluble P_2O_5	16.0	31.7	26.8	13.3	21.0	19.8	24.2	25.2
K_2O	12.1	---	---	---	23.7	---	---	19.9
H_2O	2.9	2.3	4.9	1.0	3.5	0.2	2.9	1.4

*Solution containing 21.7% free ammonia, 65.0% ammonium nitrate, and 13.3% water.

The diammonium phosphate used was typical of that produced in the TVA plant. It contained 21.0% N and 53.7% P_2O_5. A typical screen analysis follows:

Screen size, mesh	Per-cent
— 6 +20	43
—20 +28	30
—28 +48	20
—48	7

Data for runs in which satisfactory results were obtained are shown in Table I.

Very good granulation was obtained in the tests shown in Table I. The recovery of onsize product (—6 +28 mesh) ranged from 83 to 97%, so that only 3 to 17% would have to be recycled. The amount actually recycled in these tests usually was within this range. The granules were hard and strong. The diammonium phosphate was satisfactorily incorporated in the granules.

Granulation was readily controlled by addition of small amounts of water, steam, or cooling air as shown in Table I.

In some runs, the granules were cooled but not dried to determine whether drying was necessary. In run 3 (13-39-0) the product was not dried, but the data indicate that drying would be necessary to lower the moisture content sufficiently to make an on-grade product. Also, drying would be desirable to ensure good storage properties. In run 9 the formulation for 13-39-0 was changed by adding sulfuric acid and anhydrous ammonia to increase the heat of reaction and thereby obtain a drier product. The product from this run may have satisfactory storage properties without drying.

Before carrying out the present work, it was considered possible that diammonium phosphate would react with the monocalcium phosphate in superphosphates according to the following equation:

$$(NH_4)_2HPO_4 + Ca(H_2PO_4)_2 = 2NH_4H_2PO_4 + CaHPO_4$$

If this reaction occurred, it would decrease the amount of free ammonia that could be absorbed by superphosphate. However, pilot-plant tests showed that the the absorption by superphosphates of ammonia from ammoniating solutions or anhydrous ammonia was as effecient and complete in the presence of diammonium phosphate as in its absence.

It was concluded that diammonium phosphate did not enter into the chemical reactions during ammoniation and granulation to any appreciable extent. Probably the main reason for this lack of reaction between superphosphate and diammonium phosphate is that the rate of reaction is slow under the conditions existing in the ammoniator; consequently, the ammoniation reactions, which are rapid, are completed before any appreciable reaction with diammonium phosphate can take place. Perhaps the rather large particle size of the diammonium phosphate may contribute to its slow reactivity. The low moisture content of the mixtures also may be a factor affecting the reaction rate.

Bag-storage tests were carried out with the pilot-plant products to evaluate their physical properties. The results of these tests indicate that the physical properties of the fertilizers containing diammonium phosphate were about the same as those of other granular, high-analysis fertilizers. There was little or no caking when the products were cured for a few days before bagging and when the moisture content was below 3%. Some of the products did not cake even when the moisture content was higher than 3% if coated with a conditioner. The grades that contained potash were more apt to cake than the nonpotash grades when the moisture content was comparable. Potash-containing grades probably should be dried to less than 2% moisture to ensure good storage properties.

Economics of Using Diammonium Phosphate in Manufacture of Granular Fertilizers

Diammonium phosphate may be considered to replace some or all of the concentrated superphosphate and nitrogen solution in formulations for high-analysis fertilizers. The relative cost of diammonium phosphate and equivalent amounts of concentrated superphosphate and nitrogen solution will vary depending on the location. Following are the costs at a typical midwestern location of the amounts of concentrated superphosphate and nitrogen solution that are equivalent to 1 ton of diammonium phosphate:

21 units of N	0.517 tons N solution (40.6% N)	x	$57/ton	=	$29.47
53.7 units of P_2O_5	1.167 tons of CSP (46% P_2O_5)	x	60/ton	=	70.02
	1.684				$99.49

The delivered price of diammonium phosphate may be somewhat less than $99.49 per ton in some locations, but it will probably be more than $99.49 in most locations. The principal anticipated economic advantage of using diammonium phosphate would stem from its higher concentration. It is estimated that the cost of processing, storing, handling, bagging, and delivering to the dealer 1 ton of fertilizer is about $15. This does not include any costs in further handling from the dealer to the farmer or on the farm. If for example diammonium phosphate is used to increase the concentration from 10-20-10 to 12-24-12, the weight of fertilizer required to provide 40 units of plant food is decreased from 1 ton to 0.833 ton. The resultant savings in costs that are proportional to weight is $2.50. Since only 125 pounds of diammonium phosphate is required in the formulation of 0.833 ton 12-24-12, the saving is equivalent to $40 per ton of diammonium phosphate. In other words, the manufacturer could afford to pay $40 per ton more for diammonium phosphate than for equivalent amounts of conventional raw materials for the purpose of producing 12-24-12 instead of 10-20-10. Table II shows a calculation of the comparative cost of 12-24-12 and 10-20-10, using raw material prices that are believed to be typical of midwestern locations.

In some cases the use of diammonium phosphate may be economi-

Table II: Formulations and Costs of 10-20-10 and 12-24-12

Raw material	Grade	Price, $/ton	10-20-10 Lb./ton	10-20-10 $/ton	12-24-12 Lb./ton	12-24-12 $/ton
Ordinary superphosphate	20% P_2O_5	24	356	4.27		
Triple superphosphate	46% P_2O_5	60	732	21.96	879	26.37
Diammonium phosphate	21% N, 53.5% P_2O_5	108	—	—	153	8.26
Nitrogen solution X	40.6% N	57	502	14.31	520	14.82
Potash	60% K_2O	36	340	6.12	408	7.34
Sulfuric acid	—	23	120	1.38	120	1.38
Total raw materials cost				48.04		58.17
Handling, processing, bagging, and delivering				15.00		15.00
Delivered cost, per ton				63.04		73.17
Delivered cost, per unit of plant food				$1.58		$1.52

Table III: Formulations and Costs of 12-12-12

Raw material	Grade	Price,	Conventional formulation		DAP formulation	
		$/ton	Lb./ton	$/ton	Lb./ton	$/ton
Ordinary superphosphate	20% P_2O_5	17	513	4.36	775	6.59
Triple superphosphate	46% P_2O_5	60	311	9.33	---	---
Diammonium phosphate	21% N, 53.5% P_2O_5	108	---	---	166	8.96
Nitrogen solution X	40.6% N	57	500	14.25	445	12.68
Ammonium sulfate	21% N	38	200	3.80	136	2.58
Sulfuric acid	----------	23	150	1.72	150	1.72
Potash	60% K_2O	36	408	7.34	408	7.34
				40.80		39.87

cally attractive for making standard grades. Since diammonium phosphate weighs 40% less than the equivalent amounts of concentrated superphosphate and nitrogen solution, more room is left in the formulation for lower grade materials. This may be advantageous in situations where low-cost ordinary superphosphate is available.

Table III comparing formulations for 12-12-12 made with concentrated superphosphate or with diammonium phosphate brings out the economic advantage of using diammonium phosphate when low-cost ordinary superphosphate is available. It is assumed that the cost of such superphosphate would be $17 per ton.

In addition to the economic advantages discussed above, there may be savings due to better control of granulation or decreased drying requirement in production of some grades.

Translation of Results to Commercial Operation

It should be recognized that the formulations shown in Table I are not necessarily recommended formulations. Adjustments would be required in many cases to make products closer to the desired grade, and to compensate for variations in grade of raw material. The amount of steam or sulfuric acid required to promote granulation may be different in large-scale plants than in the pilot plant.

ACKNOWLEDGMENTS

The authors wish to acknowledge the assistance of Messrs. A. B. Phillips and N. L. Spencer in planning and carrying out the pilot-plant tests.

RESEARCH RESULTS & REPORTS

Gibberelic acid is causing much excitement in the lay press. There are straightforward reports, and there are some that really go all out in dreaming up its future. Nor are the Eli Lilly people sounding too conservative . . . "Capable of causing a plant kingdom revolution . . . exciting possibilities" they say. But they follow this with "But a great deal of laborious and time-consuming research still must be done before the full extent of its usefulness is known."

In case you have not followed the subject, it causes stimulated growth in field crops as well as vegetables, flowers, shrubs and trees. As the Lilly people say: "It can break dormancy in specific plants, stimulate germination in certain seeds, reverse dwarfism and induce flowering of biennials in the year in which they wouldn't ordinarily flower."

O

A-Rays are being beamed at plants to find out what will happen. We remember back in 1945 or so asking if the lush vegetation around Hiroshima could be traced back to the atomic bomb. At the time people didn't think so. But now the Atomic Energy Commission is busy finding out. They have dug a pit with a slit just wide enough to beam the rays to a hillside 100 yards away. In the pit, of course, will be a heavily shielded enclosure from which the radiation can be controlled. They have already found out a lot in other tests, but this is the big one.

Seeder. U. of Cal. range men are working on a heavy-duty seeder which drills fertilizer and seed, and covers the seed . . . all in one operation. It eliminates the extra operaion of disking, and uses half as much seed as planting from the air. We believe, however, the airplane still has utility and is here to stay.

O

Duster. A machine made in Great Britain and called the Agricola Electroduster is doing a good spraying job we learn. It is called Agricola because made by Agricola, Ltd. It is called Electroduster because it charges each particle of dust with a positive charge static electricity, causing same to cling to the plant, which is at the same time given a negative charge. Hence the dust flows to the plant.

O

GI cans form the basis for disease isolation units which cost $25 each, instead of those which cost thousands, according to David O'Meara of the Department of Animal Pathology, Maine.

O

Subsoiler. Florida's Gainesville station has been licking drought periods in sweet corn fields by a subsoiler which puts a band of fertilizer and lime 14 inches deep, breaking the hard clay below the sandy surface soil. Yields were better than with shallow plowing and surface fertilizing, obviously because the roots were encouraged to go down where the moisture was in a dry season.

O

Rice. One Allen T. Chase is reported to have mass-produced rice on some test plots in the midst of 750,000 acres he has leased from the Australian Government. Instead of coolies he used airplane seeding; (U. of Cal., please write him) fertilizing, fumigation; giant tractors that plow hundreds of acres at a time. So instead of 1600 man-hours per acre, he makes his crop with only 13 . . . and is aiming at 2c a pound delivered at market price for rice.

O

Film. USDA has been playing with polyehylene film to protect warm-temperature crops. It encourages them to set earlier, fosters vigorous plant growth, increases early yield —and, of course, protects from frost. A personal greenhouse for each plant, in short. Only trouble is that the plastic is a bit too costly now . . . but wide adoption of this plan is slated to bring it into lower price ranges.

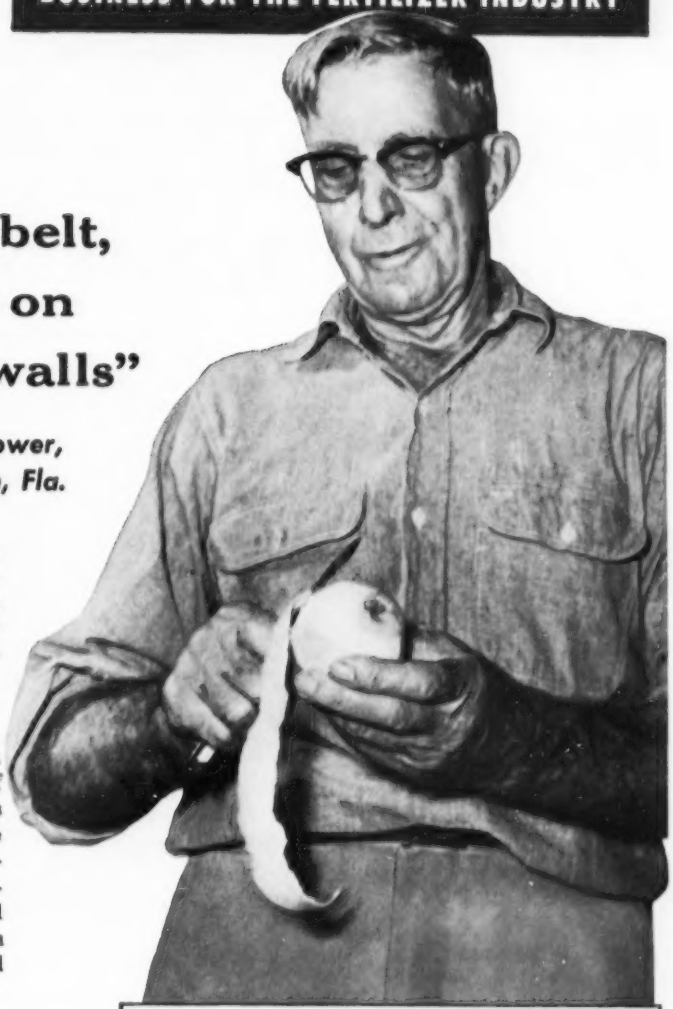
O

Calcium in the soil can protect food crops against contamination by radioactive strontium, the most dangerous by-product of nuclear fission, says Wallace Fuller of the U. of Arizona.

HOW UNION MULTIWALLS BUILD MORE BUSINESS FOR THE FERTILIZER INDUSTRY

"In the citrus belt, we're sold on fertilizer in Multiwalls"

F. M. Hahs, citrus grower, Land O'Lakes region, Fla.



"When you open up an orange like this one," says Mr. Hahs, "you see—and taste—what good fertilizer can do. I've been sold on fertilizer for 33 years, but it's never been as easy to handle as it is now that it comes in Multiwall bags."

Welcomes fertilizer tips from Union

This veteran citrus grower, who recently won a $500 award as the "longest steady customer" of the Gulf Fertilizer Company of Tampa, operates his 29-acre citrus farm along scientific lines. He is an interested reader of tips on fertilizer application that come to him through Union's countrywide information program. Union-sponsored features on fertilizer use are seen or heard in newspapers and magazines, and on radio and television stations.

Most growers and farmers, like Mr. Hahs, find Multiwall paper bags, as made by Union, the most efficient containers for fertilizer. Tight and clean, Union Multiwalls are easy to handle, stock and store; do a real job of selling your brand name. They spell satisfied farm customers for fertilizer manufacturers and dealers, contribute handsomely to a steadily increasing volume of fertilizer sales.

It's good business to use Union Multiwalls, made by a company that works actively to create good business for you.

"Union's Information program helps sell more fertilizer because it shows farmers how to use fertilizer more efficiently."

Mr. R. R. Reed, Sales Manager, Gulf Fertilizer Company, Tampa, Florida.

The Gulf Fertilizer Company, which has served Florida for 54 years, packages many fertilizers in Union Multiwalls.

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THE INDUSTRY'S FUTURE AS SEEN BY T. D. DUNSCOMBE . . . . . .

T. D. Dunscombe is manager of Materials Distribution for the Plant Foods Division of Missouri Farmers Association.* He describes himself as "very bullish on the future of the bulk mixing plant," and this article leaves little doubt that he describes himself accurately.

The author's opinions are without compromise as he predicts the downfall of conventional pulverized and granulating plants, and of complete liquid fertilizers.

Whether you agree with Mr. Dunscombe or not, you will find his ideas carefully organized and well presented.

The fertilizer industry has come a long way since the first two barrels of guano were imported from Peru in 1824. It has made phenomenal progress since the first mixed fertilizers were commercially produced at Baltimore in 1850. As a matter of fact, the advances made within the past ten years would not have been considered possible at the beginning of this century. In 1900 the average analysis of a complete fertilizer was 13%. Today, we are producing high-analysis, pelletized, complete fertilizers that contain as many as 60 units of plant nutrients. The difference in quality is even more spectacular than the increase in the units of plant food. Consumption has increased from approximately one million tons in 1900 to twenty-three million tons in 1953. The demand for high-analysis, free-flowing fertilizers is increasing; slowly, to be sure, because tradition and habit still dominate the thinking of many farmers, but this demand will increase more in the next ten years than it has in the past fifty.

The future of the fertilizer industry is very bright. While there has been a great increase in tonnage, as well as actual plant food, we are not yet replacing more than one-half the nutrients taken out by row crops. On pastures, we have barely scratched the surface. Fertilization of timberland alone could easily double our total annual consumption.

In the past, fertilizer recommendations were necessarily based on what conventional plants could manufacture. The actuality of high-analysis, water soluble, pelletized fertilizers, plus the availability of "prescription" mixed bulk fertilizers, is the beginning of a revolution that will have far reaching effects. Unless I am badly mistaken, we will see many millions of dollars in plants and equipment go down the drain within the next decade.

The following is an appraisal of the industry as it is today and a prediction of the future.

CONVENTIONAL FERTILIZER PLANT—A plant manufacturing pulverized and/or granular fertilizers with a predetermined number of grades of standard ratio.

Economic necessity limits the grades that such a plant can manufacture. As a general rule, 500 to 800 tons is the minimum quantity of any one grade that may be produced profitably. With the best of planning, there will be some grades that are handled at a loss; demands change, desire to hold large tonnage business on other grades. For practical and profitable operation a conventional plant is limited to about a dozen ratios with two grades in three or four of these.

Each year more farmers become aware of the importance of having their soil analyzed to learn the actual plant food need. Soil analysis as the basis for fertilizer application will grow more in the next five to ten years than it has in all the years since scientific soil testing has been in existence. (It is about as logical for a farmer to use a standard ratio fertilizer as it would be for a doctor to give all patients a shot of penicillin regardless of the symptoms of each.)

The demand for granular materials is increasing so fast that the manufacturer of pulverized fertilizers is between a rock and a hard spot. He has one of three choices:

1. Install granulating equipment that will cost from $150,000 to $250,000.

2. Quit the fertilizer business.

3. Use granular and/or pelletized base materials so that his final product will be a free-flowing one that will have good storing qualities.

If he invests $200,000 in granulating equipment, it is possible that it will be obsolete before it has paid for itself. He can hardly afford to quit the fertilizer business after years of effort spent in building up a profitable enterprise. The latter choice seems the most practical. He can use existing equipment to produce the quality product desired.

From a long range view-point, granulating plants are about as vulnerable as those that manufacture pulverized fertilizers. The cost of these plants will range from $250,000 to $400,000. They should be strategically located to take advantage of lowest freight rates on raw materials. This puts them at a disadvantage on outgoing materials as compared with the small bulk mixing plant. A minimum of 25 small bulk plants can be constructed

---

**MFA has gained considerable experience in bulk fertilizer blending during the past year. In 1955 they began building small "prescription mix" bulk plants throughout the state to supplement and extend the range of their three complete fertilizer plants. Eleven of the new units were placed in operation. Base materials used are ammonium phosphates (primarily 16-48-0 and 19-19-0) supplemented with granular potash and ammonium nitrate when necessary.*

Their mode of operation seems especially adapted to their locale. Missouri's fertilizer law makes no provision for regulation of grades, and requires no minimum plant food content. The University's Soils Department recommends only that the consumer buy whatever fills his plant foods needs, as shown by soil tests, at the lowest price per pound of plant nutrient.

PROGRESS REPORT TO INDUSTRY AND AGRICULTURE

what TRONA® *is doing about* Quality Control

FILE ROOM OF TEN-THOUSAND SHIPMENTS. Actual product samples of Trona domestic shipments are held in reserve for three months, export shipments six months, as a special customer service and to provide individual quality maintenance.

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for the cost of one granulating plant, and these smaller ones can better serve their respective trade areas than one large plant could serve the total area served by the 25 small plants, plus the fact that the small plants can manufacture grades and ratios economically impossible for the large centralized granulating plant.

COMPLETE LIQUID FERTILIZERS—Advantages claimed are: **1.** more readily available than dry fertilizers. Partly true. (They are no more water soluble than high-analysis water-soluble ammonium phosphate-potash materials now being manufactured.) **2.** May be transferred by pump, instead of manpower. True. **3.** May be applied more uniformly than bulk spreading of dry materials. True, but advantage is so slight as to be of no economic significance.

Limitations are much greater than the conventional fertilizer plant: **(1)** total units of plant food possible: 30-32; **(2)** storage limits the number of grades that may be formulated; **(3)** some of liquids quite corrosive, which increases cost of manufacturing equipment as well as storage; **(4)** special equipment required for application; **(5)** unit cost higher than same grade of dry fertilizer. From a practical standpoint, prescription mixing of complete liquid fertilizers is an impossibility.

As I see it, complete liquid fertilizers are a fad that will not stand the test of time and do not justify some of the extravagant claims being made for them.

(The best analysis of complete liquid fertilizers that I have seen is an article in the July, 1955, issue of Agricultural and Food Machinery, by Mr. A. V. Slack.)

STRAIGHT MATERIALS—There is much to be said in favor of the use of straight materials. Foremost is the fact that they are the most economical per unit of plant food. Straight materials, like prescription mixed dry fertilizers, may be applied accurately to offset deficiencies as indicated by soil test. For another thing, considerable evidence is accumulating that nitrogen, phosphorus and potash, individually, are needed in quantity at different stages of growth. By using straight materials each may be applied at the time to be of maximum value.

Despite these advantages, extra time and labor are necessary for their application. Time and labor that many farmers do not have.

Nationally, straight materials now account for 30% of actual plant nutrients (N 59%; available P_2O_5 20.28%; K 11.58%). I anticipate an increasing tonnage of potash for direct application, because there is some evidence that potash is required later in the life of the plant than nitrogen and phosphate. (Successful Farming, May 1956, p. 84)

I believe we will use increasing quantities of straight nitrogen materials, both for side dressing and as pre-plant applications. It seems to me that anhydrous ammonia will prove the most durable of all the nitrogens, despite the need for special application equipment. It is the most economical per unit of N. It may be applied in the late fall for the following year's crop. It may be applied at the time the land is plowed, by mounting an applicator tank on a mould-board or disc plow. It is less acid forming than most other nitrogen materials.

AMMONIUM PHOSPHATES — The most worthwhile development in the fertilizer industry is the production of high-analysis, water soluble, ammonium phosphates and ammonium phosphate-potash grades that would have been considered impossible only a few years ago. The farmers of this nation owe a debt of gratitude to those who had the vision and courage to translate into actual production what had been proven in the chemist's test tubes and pilot plants. It is now possible for a farmer to buy such grades as 19-19-0, 19-38-0, 16-48-0, 14-28-14, 12-36-2, 10-20-20, and 14-14-14.

Compare, for example: 14-14-14 with 8-8-8, 14-28-14 with 5-10-5, 12-36-12 with 4-12-4. In those areas where potash is not a limiting factor 10-19-0, 19-38-0 and 16-48-0 are saving farmers time and money as compared with lower analyses of like ratio.

Great as the saving is, where soil tests indicate a need for the grades manufactured, probably their greatest contribution to our farm economy will be as base materials for bulk mixing plants. They make it possible to formulate grades and ratios hitherto impossible, and still impossible with straight materials.

Future excellent. I foresee these multi-million dollar plants strategically located so as to serve as the mother plant of twenty to fifty small bulk mixing plants, as well as selling their products for direct application.

There are only two ammonium-phosphate plants in the United States—Pasadena, Texas and Joplin, Missouri. There is a need for several more, but their location will be most important from a service and profit standpoint. The ideal location will be adjacent to an anhydrous ammonia plant—preferably the same ownership—with water transportation available for rock phosphate, and a nearby source of sulfuric acid. They will manufacture their own phosphoric acid. They will probably make one grade each of the following ratios: 1-1-0; 1-2-0; 1-3-0; 1-1-1; 1-2-1; 1-3-1; 1-2-2. They will need to be so efficiently managed as to be competitive, and the finished product must be a pelletized one of uniform size.

BULK MIXING AND BLENDING PLANTS—There is a distinct difference between a bulk "mixing" plant and a blending plant, even though they may use identical equipment. A mixing plant formulates on a guarantee of analysis basis. A blending plant merely blends straight materials in the ratio desired by the customer.

These are the plants of the future. They are the only plants that can "prescription" mix to exact requirements as indicated by soil test. They are relatively inexpensive as compared with a conventional plant, $10,000 to $50,000 each, and I have seen one blending plant that is doing a satisfactory job on an equipment investment of less than $2,000. They may be located close to the market they are expected to serve, usually a radius of 30 to 40 miles. Base materials are available so that they can make a complete formulation comparable with the best conventional granulating plant. They can deliver and spread, in bulk, at a price no greater than a farmer pays for bagged material at the dealer's warehouse. (The farmer then has the expense of hauling, storing and applying the bagged fertilizer.) Depending upon the base materials used, they can formulate higher analyses than any conventional plant.

TRANSPORTATION—Since this is a major cost item to the fertilizer manufacturer, it seems some comment would be in order.

On some raw materials alone freight represents 27% to 60% of the total cost. There have been thirteen (13) increases in rail freight in the past ten years, and it does not look like the end is in sight.

Any company that is considering a new plant would be well advised to explore site possibilities adjacent to water transportation.

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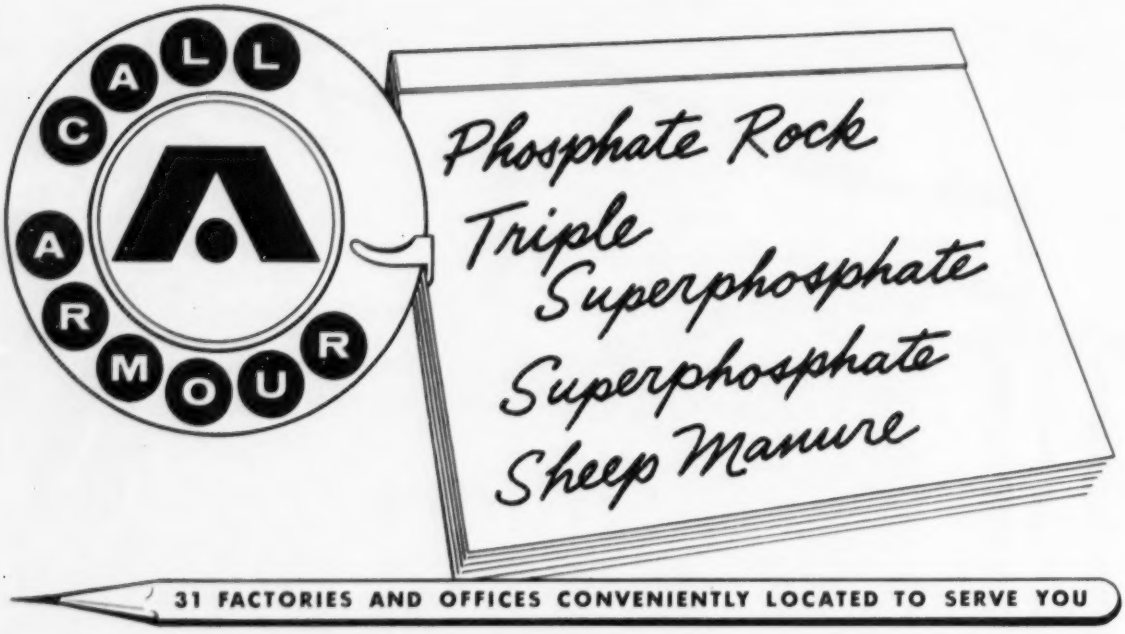

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INDUSTRY CALENDAR

Date	Organization	Place	City
Oct. 15-17	Nat'l Nitrogen Solution	City Auditorium	Sioux City, Ia.
Oct. 16-18	Fert. Ind. Round Table	Shoreham Hotel	Washington, D.C.
Oct. 18-19	Control Officials Assn.	Shoreham Hotel	Washington, D.C.
Oct. 21-22	Fert. Safety Section	LaSalle	Chicago, Ill.
Oct. 25	Middle West Soil	Sherman	Chicago, Ill.
Nov. 2	Sou. Soil Conf.	Atlanta Biltmore	Atlanta, Ga.
Nov. 7-9	Pac. NW Plant Food	Harrison Hot Springs	Harrison Hot Springs, B.C.
Nov. 7-9	Agric. Ammonia Inst.	Atlanta Biltmore	Atlanta, Ga.
Nov. 11-13	Calif. Fert. Assn.	Del Coronado	Coronado, Cal.
Nov. 27-28	Indiana Fert. Conf.	Memorial Union Bldg. Perdue Univ.	Lafayette, Ind.
Nov. 28	Okla. Fert. Dealers Conf.	Okla. A&M College	Stillwater, Okla.
Nov. 29	Okla. Sales & Crops Conf.	Okla. A&M College	Stillwater, Okla.
Dec. 10-12	No. Central Weed	Sherman Hotel	Chicago, Ill.
		1957	
Jan. 8-9	Texas Fert. Conf.	MSC	
Jan. 23-25	Sou. Weed Conf.	Bon Aire	Augusta, Ga.
Feb. 14-15	Middle West Soil	Edgewater Beach	Chicago, Ill.
July 10-14	Plant Food Producers of Eastern Canada	Manoir Richelieu	Murray Bay
July 17-19	SW Fert. Conf.	Galvez Hotel	Galveston, Texas

Nitrogen Division Issues Handbook

A new, 48-page nitrogen solutions handbook for the fertilizer and chemical industries has been published by Nitrogen Division, Allied Chemical & Dye Corp.

The new book contains the most up-to-date nitrogen solutions technical data available. It describes the chemical and physical properties of solutions and how to store, handle, and use them in fertilizer manufacturing. The book also presents new information on granulation and formulation of fertilizers. Numerous formulas and conversion factors also are included.

The handbook is fully illustrated with scenes of typical fertilizer manufacturing and solutions handling arrangements. Copies may be obtained free of charge by writing to Public Relations Department, Nitrogen Division, Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.

Booklet On Acid Resistant Heat Exchangers

A new, illustrated booklet titled, "Acid Resistant Heat Exchangers" is being offered by the Swenson Evaporator Co., a division of Whiting Corporation. The booklet gives important data on the Swenson type of tube mounting, the types of corrosion resistant materials available and the advantages of the neoprene ring gaskets. Illustrated are typical sections of head exchangers and a chart giving performance data.

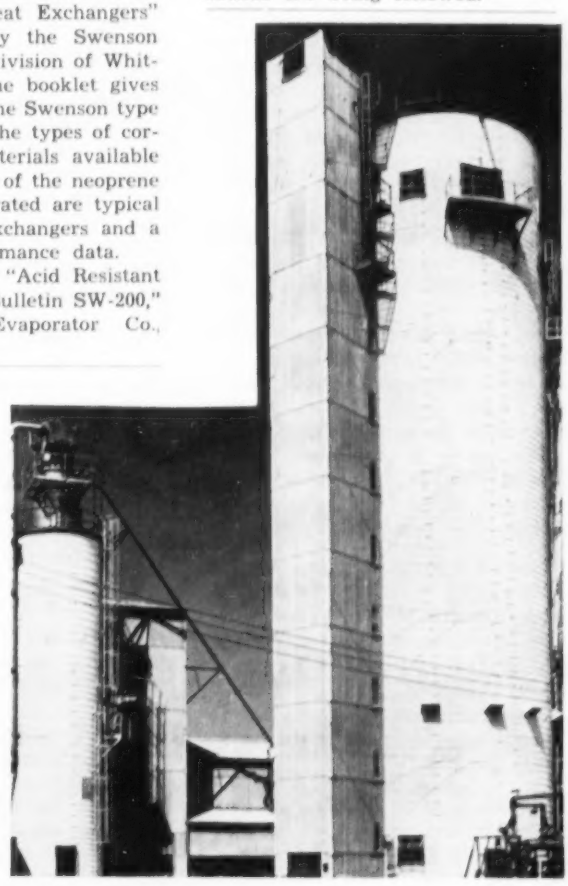
For free copy of "Acid Resistant Heat Exchangers, Bulletin SW-200," write Swenson Evaporator Co., Harvey, Ill.

Arkansas Fertilizer Regulation

Regulation No. 1 of the Fertilizer Law was adopted by the Plant Board at the quarterly meeting held July 26. This regulation requires that each registered manufacturer, manipulator, or jobber report to the Plant Board the sale and/or shipment of all fertilizers distributed to unregistered parties in Arkansas, by county and grade. The regulation was made retroactive to July 1.

The following methods of reporting are outlined in the regulation: (1) Submit an invoice for each shipment or sale of fertilizer. (2) Submit a quarterly report listing the destination county and kind of fertilizer distributed. Each manufacturer may choose which method he desires to use, and will be required to notify the Plant Board of his choice, at least 30 days prior to the beginning of the fiscal year.

Information obtained from these reports will enable the Plant Board to publish a yearly summary of use of fertilizers, by county and type. This data should be of considerable value to agricultural workers in determining whether soil recommendations are being followed.



At the new petro-chemical division of Sohio Petroleum at Lima, O., the problem of putting up a prilling tower that was to be the tallest ever built as this one was, able to resist stresses and wind-pressures—and ready to go even higher in the future. The engineers, Vulcan-Cincinnati put it up to The Marietta Concrete people.

Marietta's president, F. L. Christy dug back into the past and brought out forms for a six-inch stave, used many years ago, together with the proper moulds—and these proved the answer.

Despite freezing weather and mud, the job was done between September 19 and January 11 . . . speed of delivery and economy having been among the reasons Marietta was asked to do the job. Long life and the pleasing appearance of the concrete stave construction are two more reasons.

The result is the first tower of its kind, built with precast concrete staves and reinforced with steel hoops.

In the smaller picture is the large storage and bagging building, also constructed there by Marietta, of reinforced insulated precast wall panels, which can be clearly seen in the photograph.

Around the Map

ARIZONA

Arizona Sulphur Co., Glendale, has been formed to manufacture dusting and soil sulphur, **Harry A. Medley,** president, is also president of **United Sulphur Company,** Los Angeles, where general offices of both concerns are located.

* * *

U. S. Guano Corp. has been formed as a wholly owned subsidiary of **New Pacific Coal & Oils, Ltd.** to apply modern methods to recovery of guano in the Arizona Grand Canyon where the company holds U. S. lease of more than 60 acres. Surveys indicate more than 100,000 tons immediately visible, with other caves not yet explored. A tramway, said to be the longest in the world, rising 2911 feet from the caves and running horizontally for 8377 feet has been contracted for with **U. S. Steel.** Trucks will convey the guano to Kingman for baging and shipment. In addition to the established profit of $10,000,000 from fertilizer sales, the concern believes valuable pharmaceuticals may be extracted.

CALIFORNIA

United States Borax & Chemical has begun construction of their new laboratory which will serve all three divisions. It will be located in Anaheim, will occupy some 30,000 square feet. Construction will be of reinforced concrete with generous window areas, the resulting outdoor effect being augmented by interior courts and plantings. **Haas and Haynie-Frandsen,** general contractors estimate completion by April of the $850,000 building.

* * *

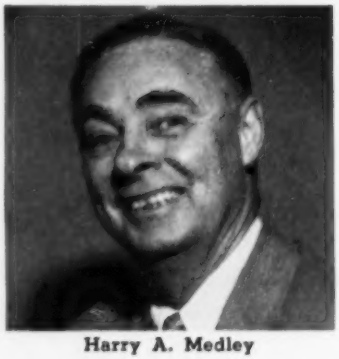
Universal Fertilizer, La Puente, has been cleared by the Regional Planning Commission to continue fertilizer manufacture.

FLORIDA

U. S. Phosphoric division of **Tennessee Corp.** resumed operaions in Tampa early last month after a 6-week layoff.

* * *

M-16 Products is in operation with their Winter Garden plant, turning out some 65 daily tons of fertilizer.



Harry A. Medley

Stafford Shoals Corp. has applied for a permit to harvest seaweed along the coast between Fernandina and St. Augustine. While the primary purpose is to extract pharmaceutical chemicals, fertilizer is included in the plans. **John S. Robas** is president.

* * *

American Cyanamid's "bright silver and glowing orange" plant at Orange Park has called forth a deluge of local newspaper adjectives. They plan to close up the old Saddle Creek phosphate plant at year end, and transfer all operations to Orange Park, according to **Arthur Crago** manager of the division.

* * *

Wilson and Toomer Fertilizer's plant at Port Everglades suffered a fire in a warehouse containing pulverized tobacco.

* * *

Lake Region Packing Assn., Tavares, lost considerable fertilizer and suffered an overall total of some $233,000 in a fire which destroyed their fertilizer plant, built in 1953. The plant has a reputation for good housekeeping.

ILLINOIS

Darling & Co. had a $3000 fire in their five-story Chicago building.

* * *

H. D. Campbell, Rochelle, has formulated, packaged and put on the market for the coming Christmas season a special preservative designed to prevent falling of tree needles, reduce fire hazard.

LOUISIANA

Commercial Solvents' Sterlington plant had a blaze due to bursting of a 4000 pound pressure ammonia line, which came under control quickly with minor physical damage.

* * *

Crown Zellerbach have announced a $4,000,000 multiwall bag plant at Bogalusa, construction to start in December; completion by next Fall.

MISSOURI

Chemagro, New York, are planning a $2,000,000 plant in the Northeast Industrial District of Kansas City, according to **George W. Hill, Jr.,** president. Chemagro's principal owners are **Pittsburgh Coke & Chemical** and the German concern, **Farbenfabriken Bayer.** They have bought 25 acres and optioned 25 more.

* * *

Davison Chemical recently entertained agricultural leaders from four states at their Joplin plant.

OHIO

The Chemical and Industrial Corp., Cincinnati, has recently completed contractural relations with the **Engineering and Industrial Corp.** of Luxembourg, and are now authorized to license the Prayon process to users in the US.

* * *

Dravo Corp. is completing for **Olin Mathieson** six 195 foot covered hopper barges at its Ohio River shipyard near Pittsburgh. O-M is expanding its already large inland waterway fleet.

* * *

The Farmers Fertilizer Co., of Columbus, has announced the installation of new manufacturing facilities being designed and furnished by the **D. M. Weatherly Co.,** to be installed during the winter.

* * *

Ohio Equity Exchange Company's new granular fertilizer plant in Crestline, went into operation recently. The plant was designed and all of the equipment furnished by the **D. M. Weatherly Co.**

* * *

Tyler Grain and Fertilizer Co., Wooster, has announced good progress on their new granulation facilities and storage building being installed in Weilersville, designed and furnished by the **D. M. Weatherly Co.**

PENNSYLVANIA

York, presumably witnessing the operation of its sister Pennsylvania city, McKeesport, is contemplating the sale of sludge as fertilizer.

* * *

Haller Oil contemplates the produc-

What you want When you want it!

FROM Albemarle's vast timberlands, pulp mills and bleaching plants to the final production of Raymond Multiwalls, strict technical control assures the complete protection of every "bagable" product . . . Papers of all descriptions including a wide range of specialties adapted to individual needs . . . Any number of plies . . . Clean, radiant printing . . . And of special importance, quick deliveries always.

Raymond

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Sackett Builds The Equipment You Need

- **Continuous Granulating Units**
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Crushers
Disintegrators
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Dust-Arresting Equipment
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Plant Mechanization Systems
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tion of liquid fertilizer at Lancaster, and has applied for permission to store anhydrous ammonia on the plant site. They plan storage of 40 to 80 tons, while the zoning ordnance limits the quantity to a half ton.

SOUTH CAROLINA

Virginia-Carolina's North Charleston plant was rocked, middle of last month by a heavy explosion when molten ferrophosphorous slag spilled onto damp ground, at a temperature around 2800 degrees. No injuries or damage was reported.

SOUTH DAKOTA

Crest Chemical Co., Watertown, has made good progress on construction of their new fertilizer granulating plant in Watertown, according to president **M. A. Sharf.** The facility was designed and furnished by the **D. M. Weatherly Co.**

VIRGINIA

Smith-Douglass' Smith-Rowland Co. has changed the name of its nitrogenous tankage product from "Smirow" to "Nutronite" derived from nutrition and nitrogen.

WASHINGTON

Phillips Pacific recently made first shipment of aqua ammonia from its Coulee plant near Kennewick. Anhydrous will continue to be shipped into the Northwest from Texas until Coulee facilities are completed at which time Coulee will produce ammonia in both forms.

* * *

Washington Organic Fertilizers Inc. are producing at Wapato a fertilizer in stick form, developed by **Lee Vann Derlinden.** The user simply makes a hole in the ground, inserts the stick—which then dissolves as moisture is applied. Fruit growers report good results from the sticks, which contain NPK and seven trace elements. An average pear tree requires about 12 sticks. Special formulas can be made.

WISCONSIN

Kickapoo Fertilizer, division of **Mid-West Phosphate,** reports good progress on their new fertilizer plant near Stevens Point.

CANADA

Canadian Industries Ltd. Millhaven, Ont., plant is nearly ready to go into production. The largest anhydrous plant in Canada, it cost $9,000,000; will produce 200 daily tons.

* * *

Canada Packers' Woodstock, New Brunswick plant received a silver plate as first prize for the best float in the local Old Home Week this Summer.

INDIA

Fertilizers and Chemicals' Travancore Ltd. is using the greatly improved net profit of this year's operations to back a plan which contemplates a $4,000,000 investment in doubling its ammonium sulphate and ammonium phosphate output to 80 daily tons.

ISRAEL

Fertilizers and Chemicals Ltd., Haifa, have this year produced twice the superphosphates contemplated, and are now operating at the rate of 100,000 annual tons, enough to supply all Israel's needs and leave 10,000 to 15,000 tons over for export.

MEXICO

Montrose Chemical, California, will build in Irapuato a $4,000,000 plant designed to produce 20 daily tons of chlorine; 20 of caustic soda and 4,000 annual tons of DDT.

PAKISTAN

Pakistan-American Fertiliser Factory, Daudkhel will be in production this year with capacity for 50,000 annual tons of ammonium sulphate and 40 daily tons of ammonia.

PORTUGAL

Amoniaca Portugues, at Estarreja, has been approved by the Government for expansion from its present 25,000 annual tons of sulphate of ammonia to 70,000 annual tons. The expansion is due to be completed by 1958.

SCOTLAND

Scottish Agricultural Industries Ltd. Leith, are building a new concentrated granular fertilizer plant. This includes three main process units: sulphuric acid, phosphoric acid and a formulation and granulation plant designed by **Dorr-Oliver.** The entire project includes reconstruction of their existing nearby fertilizer plant, and will total some $8,500,000. The D-O designed plant will produce a variety of concentrated granular fertilizers using the familiar Dorrco Granular Fertilizer Process. This process features the coating of muriate of potash, filler and recycled fines with relatively thin slurries of ammonium phosphate and ammonium sulfate. After granulation in a Dorrco Blunger the pellets are dried and screened. Oversize product is crushed and mixed with the undersize to be recycled to the Blunger. The intermediate screen fraction is final product and will be bagged and shipped to numerous S. A. I. centers throughout Scotland. The sulfuric acid unit began production in August and construction of the

THE NEW SACKETT STAR* GRANULATOR

The Sackett STAR Granulator is an entirely new and revolutionary approach to the granulation of fertilizer mixed goods.

Here's what the STAR will give you:

CONTROLLED GRAIN SIZE

New concept of grain size control. Larger percentage in 6 by 16 mesh range, smaller portion of oversize.

HIGHER PRODUCT RECOVERY

Up to fifty percent increase in product recovery, because of its inherent, vigorous rolling—*not sliding*—action.

HIGHER PRODUCTION CAPACITY

More granulation the first time through, means substantially higher production capacity.

LOWER DRYING COST

Higher percentage of on-size in initial granulation means less fuel cost per ton due to lower hydration of total feed.

* U.S. and Foreign Patents Pending

THE A. J. SACKETT AND SONS COMPANY
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Established fertilizer producers are invited to get our up-to-the-minute counsel on their conversion and expansion programs. It is available without cost.

Architects and Manufacturing Engineers to the Fertilizer Industry Since 1897.

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phosphoric acid unit and the granulation plant is nearing completion.

All three process plants, the major portion of the new S.A.I. project, are being built on 19 acres of land reclaimed from the Firth of Forth by **Leith Dock Commission.** Because of this location with deepwater dock facilities, imported raw materials—phosphate rock, sulfur and potash—can be shipped directly to the plant by water. These materials will be unloaded at a rate of 350 tons per hour and stored prior to use in a storehouse of 56,000 ton capacity.

SPAIN

Union Espanola de Explosives, and **Sociedad Iberica del Nitrogene** have applied for permit to build a plant at Seville to produce 25,000 annual tons of nitrogen, 30,000 of phosphoric anhydride and 25,000 of potash for the manufacture of nitrogenous fertilizers, urea, superphosphates. They have asked the installations to be classified as of "national interest" to cover expropriation of land, exemptions from custom duty for imported machinery and a rebate of 50 % on imports.

CHANGES

Balfour, Guthrie & Co., Limited have moved their Chicago office to Minneapolis, in the Midland Bank Building, Second Ave. South at Fourth Street, Suite 930. Phone Federal 2-4356.

• • •

The new corporate name and the location of permanent offices for **Escambia Bay Chemical Corporation** were announced today by **R. U. Haslanger,** president.

The corporation discontinued the use of the word "Bay" in its official title today to become **Escambia Chemical Corporation.**

The executive offices of the corporation now occupy the twentieth floor at 261 Madison Avenue, New York. Offices of the president; the resin sales manager, **W. W. Peacock, Jr.,** and the commercial development manager, **A. N. Wohlwend** are all located at this address. The corporation's research and development is located at Cambridge and Newton, Massachusetts, under the direction of **Dr. N. C. Robertson,** vice president.

Escambia Chemical began commercial production of ammonia, nitric acid, ammonium nitrate and nitrogen fertilizer solutions at its Pensacola plant last year. The sales agency for the firm's nitrogen fertilizer products is **Ashcraft-Wilkinson Company;** Trust Company of Georgia Building, Atlanta, Georgia.

• • •

Ashcraft-Wilkinson Company, sales agents for **Duval Sulphur & Potash Company,** announces the opening of a new district sales office at Des Moines, Iowa, under the supervision of **James S. Greene.**

This new district office, located in the Insurance Exchange Building, will provide improved service to customers in Colorado, Idaho, Iowa, Kansas, Minnesota, Missouri, Nebraska, North Dakota and South Dakota.

R. W. Breidenbach

Commercial Solvents Corporation will launch a major expansion of its agricultural chemicals sales and customer service in the midwest for the 1956-57 fertilizer season, it has been announced by **Clyde T. Marshall,** general manager of the agricultural chemicals department.

R. W. Breidenbach has been named Midwest sales manager to direct the expanded effort. He will make his headquarters at CSC's district office in St. Louis, Missouri. Mr. Breidenbach has been the Company's assistant general manager of agricultural chemicals sales in New York and has been associated with Commercial Solvents since 1948.

• • •

New offices for the Southwestern district of the plant food division, **Olin Mathieson Chemical,** have been established at 4520 Clinton Drive, Houston 20, Texas.

George A. Kelt, district manager, said additional space and the new office layout at the new location make possible more efficient handling of orders. The new offices connect with the Southern Warehouse, a shipping facility for Ammo-Phos fertilizers.

The district offices formerly were in the Gulf Building in downtown Houston.

• • •

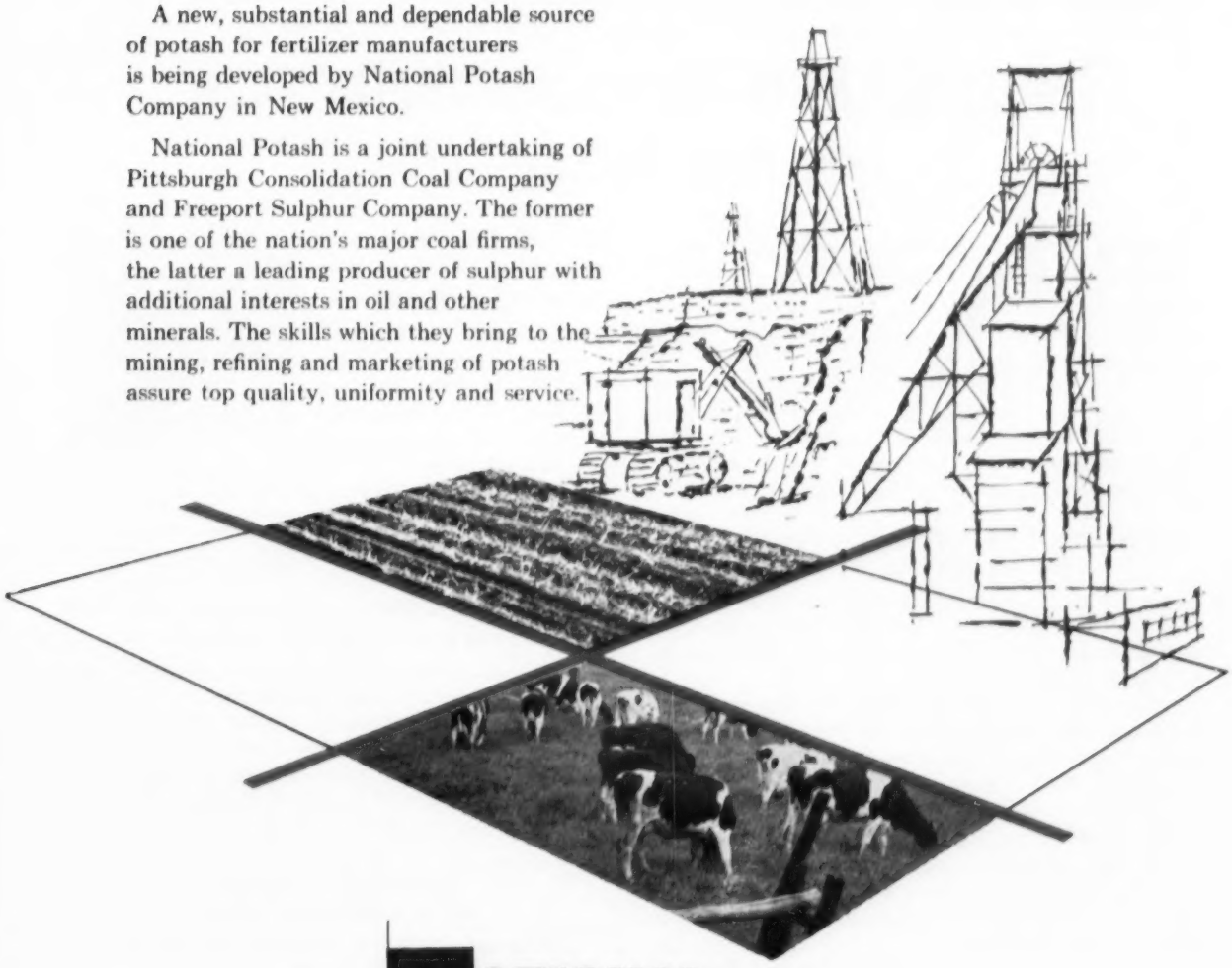
St. Regis Paper Company, in an expansion of its multiwall packaging division sales facilities in Texas, announces the opening of a new sales office in Amarillo, and the move of its Dallas office to larger quarters. **Reid H. Williams,** previously in the Dallas office, has been named man-

The Smith-Douglass Co. in its 1956 Annual Report, released during September, announced the company's movement into this new home office at 5100 Virginia Beach Blvd., just outside Norfolk, Va. The new executive offices house the parent Smith-Douglass Co. and the Coronet and Smith-Rowland divisions. All formerly occupied several floors of the downtown Board of Trade Building.

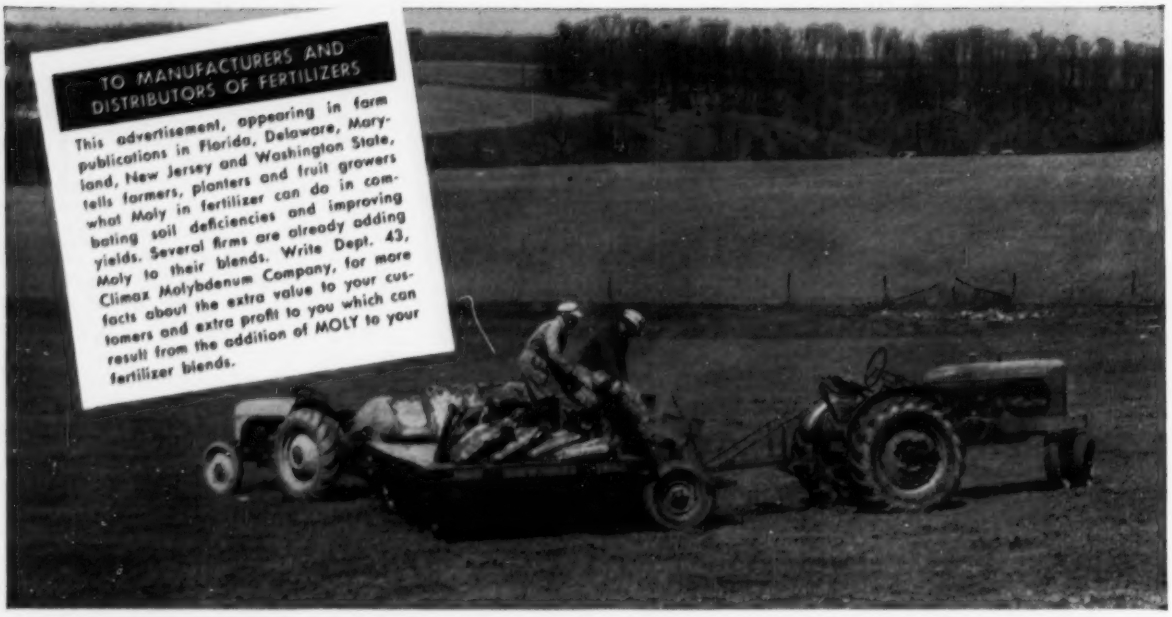
a joint venture in Potash

A new, substantial and dependable source of potash for fertilizer manufacturers is being developed by National Potash Company in New Mexico.

National Potash is a joint undertaking of Pittsburgh Consolidation Coal Company and Freeport Sulphur Company. The former is one of the nation's major coal firms, the latter a leading producer of sulphur with additional interests in oil and other minerals. The skills which they bring to the mining, refining and marketing of potash assure top quality, uniformity and service.



NATIONAL POTASH COMPANY
205 EAST 42nd ST. • NEW YORK 17, N.Y.


TO MANUFACTURERS AND DISTRIBUTORS OF FERTILIZERS
This advertisement, appearing in farm publications in Florida, Delaware, Maryland, New Jersey and Washington State, tells farmers, planters and fruit growers what Moly in fertilizer can do in combating soil deficiencies and improving yields. Several firms are already adding Moly to their blends. Write Dept. 43, Climax Molybdenum Company, for more facts about the extra value to your customers and extra profit to you which can result from the addition of MOLY to your fertilizer blends.

Clyde Speck and Willard King load fertilizer in the spreader, for use on Mr. Speck's farm, near Asbury, New Jersey.

MOLYBDENUM increases alfalfa yield on New Jersey soil

Adding Molybdenum to Moly-deficient soil gives the farmer higher yields of alfalfa

Scientists* have shown that when proper amounts of Moly are added to acid Moly-deficient soils in New Jersey, marked improvement in yield and protein content of alfalfa results. Both field and laboratory tests were conducted upon the benefits resulting from the proper use of Molybdenum. In many areas of New Jersey centuries of leaching have robbed the soil of much of its available Molybdenum. With this deficiency corrected, alfalfa yields showed improvement of over 12%.

Experience of Mr. Clyde Speck demonstrates this notable improvement

On his farm near Asbury, New Jersey, Mr. Speck has a field of some 14 acres planted to alfalfa. His yields on successive cuttings decreased, and finally Mr. Speck decided to put the field to other use.

"About this time," said Mr. Speck, "I showed this field to a salesman for a fertilizer company. He examined my soil and told me that other farmers in this area had been having trouble with alfalfa. He suggested that we use Moly on this field of mine, and then re-seed.

"We applied Moly, about 2 to 3 ounces per acre. We had the Moly mixed with my regular fertilizer, and then I re-seeded. For the three years since I applied Moly to this field I have had good stands of alfalfa and the yields are fine. Moly made the difference."

*Evans, H. J. and Purvis, E. R. (Rutgers University) "Molybdenum status of some New Jersey soils in respect to alfalfa production".—Agronomy Journal 43:70-71 (1951).

All crops need Moly, as shown by widespread tests in U.S. and abroad

During the last 15 years tests made in many parts of the United States and abroad show conclusively that all crops need Moly in a form that can readily be assimilated. When available Moly is not present in the soil Moly should be added, either alone or combined with fertilizers.

"My alfalfa field now has a full stand," says Mr. Speck, "and I feel that with its Moly-deficiency corrected it will continue in high production for several years."

It will pay you to find out now whether your own soil can benefit from the use of Moly

If you are getting low yields on crops such as alfalfa, cauliflower, tobacco, lettuce, beets or citrus, get in touch with your County Agent. He will be glad to help you set up test plots.

Write for our Bulletin: "Testing for Molybdenum Deficiency". Address Dept. 57, Climax Molybdenum Company, 500 Fifth Avenue, New York 36, New York.

MOLY CAN BE ADDED TO ANY FERTILIZER BLEND

When ordering fertilizer you can always specify that Molybdenum be included as an additive.

CLIMAX MOLYBDENUM

ager of the new Amarillo office, located at Room 222, Mayes Building, Amarillo, Texas. This office will be under the supervision of the Dallas office in the Southwestern district.

The Dallas office, which includes the Multiwall Packaging Division and the Panelyte Division, has moved to a new location at 6923 Snider Plaza, P. O. Box 8187, Dallas 5, Texas.

• • •

W. S. Tyler, president, **Longhorn Construction Company** of Sulphur Springs, Texas, announces that the firm has been reorganized and that an extensive expansion program is under way.

Other officers of the company are Charles H. Tyler, vice-president; field engineer in charge of construction; Arnold Neumann, business administrator.

Mr. Newman recently resigned as general manager of the **Red Star Fertilizer Company** to purchase an interest in the Longhorn firm. Before coming to Sulphur Springs to

W. S. Tyler

head the Red Star Fertilizer Division, Mr. Neumann was sales manager for the Oklahoma Fertilizer and Chemical Company. He previously had been with the Thurston Chemical Company of Tulsa.

Red Star Division operations have been expanded greatly under Neumann's management, with new machinery installed by the Longhorn organization, sales territory greatly expanded and production increased substantially.

Longhorn manufactures and installs continuous granulation plants, and continuous acidulating phosphate plants, as well as various other related units connected with the fertilizer industry. Its sphere of activity covers all areas of the United States as well as some projects in foreign countries. Plants built by the company include new installations at Clarksdale, Miss., Nashville, Tenn., Knoxville, Tenn., Wichita, Kas., Harlinger, Tex., Oklahoma City, Muskogee, Okla., Bartlesville, Okla., Ashkum, Ill., Danville, Ky., Russellville, Ky., Nacogdoches, Tex., Houston, Miss., Sulphur Springs, Shreveport and Pittsburgh, Tex.

• • •

Fannin Farm Service Co., Phoenix, Ariz., has been leased to **California Spray-Chemical,** including all real estate, buildings and facilities under terms which indicate ultimate Cal-Spray ownership. In fact, **A. W. Mohr,** Cal-Spray president has already issued the usual assurance to personnel.

Random NOTES & QUOTES

Camel equals $1200 worth of fertilizer. At least that's the deal arranged by the City of Jackson, Miss. Having no fertilizer of their own, they bought that much from **North Atlantic** to be delivered to the owner of the camel in Africa, who needed the fertilizer. Somehow this avoids certain taxes for the City and the African camel-owner . . . and everybody is happy including, presumably, North Atlantic and Chemical. Not to mention the male camel already in the Jackson zoo, which gains a mate. The female camel is a dromedary, which the dictionary says is easily trained for riding.

●

Rules governing leases of government-owned phosphate lands have been changed to eliminate the requirement that lessees spend certain amounts during the first three years, and to provide a way to determine the legal heirs of deceased licencees. There are proposals, and you are invited to submit written comments to the Interior Department, if you are what they call an "interested person."

●

Menace lies in the growing immunity of insects to insecticides, according to Dr. Samuel W. Simmons of the US Communicable Disease Center. "A problem of the utmost importance," he says, pointing out the danger from such diseases as malaria, now that mosquitoes seem to survive 95% a strong spray whereas a much weaker spray formerly killed off 95%. But take heart . . . more than 100 laboratories, all belonging to WHO (World Health Organization) are hard at work on the problem, as are some insecticide folks.

●

Waste of insecticides on lawns in Florida occurs because tons of the wrong pesticides are used. Folks think insects cause the brown spots on their grass, whereas a lot of it is caused by grass ailments of various kinds. On the other hand, a lot of the brown spots really do come from bugs . . . so what is the poor homeowner to do? He should take a tin can with both top and bottom removed. Push this into the ground. Fill with water. Pretty soon cinch bugs will float to the surface. If they do, use insecticides. If they don't . . . well you haven't lost anything and are right back where you started.

●

Perpetual motion has almost been achieved by the sewage plant at Knoxville, Tenn. It operates on its own gas, produces its own fertilizer and grows its own tomatoes. In the winter they heat by gas, and we suppose, fry their tomatoes.

●

Good wicket. The Financial Times, London, commenting on the position of Lawes Chemical—fertilizer people—says that the Chairman's forecast last year was "batting a good wicket judged by the growing and harvesting weather to date." Must have been a very nice wicket as they raised their dividend rate to 12½% "with threefold cover."

●

TVA has announced seven new patents, of which two are on ammoniation. They have also announced they are producing liquid fertilizers on an experimental basis, about 10

hourly gallons, to be used for test purposes.

●

Glad sack. We are fascinated with the character, an animated fertilizer sack, which appears in Nitrogen Division's TV commercial . . . which, by the way, is called "Bless My Soil."

●

1957 should benefit by the carryover of impetus which has been gained in 1956—which looks to be the biggest in history in terms of production, employment and earnings, according to Dr. Schmidt of the National Chamber of Commerce economic research department.

●

Cotton markets development is being held back, according to the National Cotton Council's chief economist, Dr. Horne, because cotton mills are holding back, disturbed over Japanese textile imports. "Genuinely demoralized" and "fearful of its future" were words he used.

●

Soybean marketing problems may arise next year if production keeps on rising as fast as it has in the past 3 years, according to George Strayer, American Soybean Association executive v-p.

●

Carryover stocks of cotton, wheat, corn and other major farm products are bearing down on the price structure and force drastic production adjustments which work against efficient farm management and cost the Government hundreds of millions of dollars, pointed out Marvin McLain, assistant Secretary of Agriculture to the Soil Conservation District Commissioners Conference in September.

Optimism was expressed, on the other hand, by Peter Colfax, American Potash & Chemical president, who said "It is difficult to be other than optimistic on the long-range prospects for the chemical industry." It has grown 10% average per year as compared to over-all industry average of 3% average per year during the past 25 years.

●

Louis Wilson told the National Commissioners, Secretaries and Directors of Agriculture last month that all of us have an opportunity and an obligation to relate technological developments to the good of agriculture . . . which needs it. He spoke for the "founding fathers" of the National Plant Food Institute who had made it one of the basic obectives "to cooperate with the fertilizer control officials in the several states in accomplishing a better understanding of the state fertilizer laws."

Triangle Brand Copper Sulphate has been recognized as an effective agricultural chemical for more than sixty years. In sprays (where Bordeaux mixtures are the most reliable), **in dusts (if you prefer them)** and in fertilizers (for additional enrichment of the soil) Triangle Brand Copper Sulphate has proved itself worthy and dependable. Try these Triangle Brand forms of Copper Sulphates:

INSTANT (powder) for quick and efficient mixing or Bordeaux sprays.

SUPERFINE (snow), SMALL or LARGE CRYSTALS, all containing 25.2% metallic copper.

BASIC Copper Sulphate in powder form, containing 53% metallic copper.

Write for booklets that will help you solve your agricultural problems.

Control POND SCUM and ALGAE with Triangle Brand Copper Sulphate. Write today for information on how it can help you maintain healthy water conditions.

PHELPS DODGE REFINING CORP.
300 PARK AVE. NEW YORK 22, N.Y. • 5310 W. 66th STREET, CHICAGO 38, ILL.

Smith-Rowland Announces Change In Product Name

The Smith-Rowland Co., manufacturer of nitrogenous tankage since 1921, has announced that "Nutronite" will be the new name for their product. Russell Spivey, Smith-Rowland manager, explained that the new name more aptly describes the product, formerly known as Smirow tankage. "Nutro" is derived from nutrition and "nite" is symbolic of the nitrogen the product contains, he said.

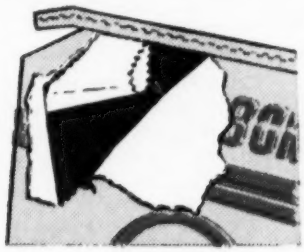
"Nutronite" is a 100% natural organic water-insoluble source of nitrogen. Tobacco farmers and citrus growers have long looked for its tiny, dark particles in their fertilizers as a mark of quality, Spivey said. In addition, these organics are widely used in mixed fertilizers. In some recent farm surveys, it has been reported that farmers rank organic content above many other factors influencing their fertilizer purchase.

"Nutronite" is also sold for direct application to lawns, being marketed in 50-pound bags for that purpose by the Smith-Douglass Co., parent company of Smith-Rowland. For direct application, the product is sold through hardware and garden supply stores.

The "Nutronite" name change became effective July 1.

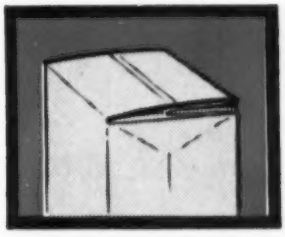
New Developments at A&S

THE TILTED VALVE BAG



This new closure was developed by one of our customers to prevent sifting of fine materials, and is now offered on standard A & S bags without upcharge. The Tilted Valve is a must for the fertilizer and rock products industries, which have long been seeking a multiwall bag combining an automatic closure with a positive, sift-proof seal.

THE ARKTITE BAG

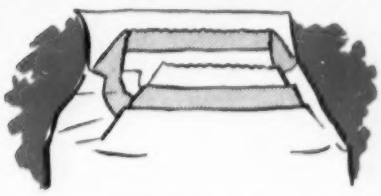


The new A & S Arktite Bag is not only sift-proof and tamper-proof, but also capable of standing upright on packing lines and shelves. It has thermoplastic seals throughout and liners of paper, film or foil.

THE ZIP-TOP MULTIWALL BAG

Already a favfavorite with multiwall users from coast to coast, the A & S Zip-Top is typical of the trend-setting features you find on our bags. This new easy-opening construction is available on any A & S multiwall at no extra cost.

THE STEP-FLEX BAG



A new multiwall bag soon to go into production. It is triple-sealed top *and* bottom with the unique Step-Flex closure, forming a sift-proof barrier against product loss or contamination. This new closure provides three multiwall layers, staggered and pressure-glued both ways in overlapping fashion.

OTHER POPULAR A & S BAGS

SUPER-RUFF— non-slip bags
LAMO-PAK— moisture barrier bags
LOCK-RITE— sealed valves
DUK-PAK— sheds water

To get the whole A & S bag story — particularly as it applies to your own products — we suggest that you write directly to Arkell & Smiths, Packaging Division, Canajoharie, New York.

ARKELL AND SMITHS

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Manufacturing Plants at:
Canajoharie, N. Y. • Wellsburg, W. Va.
Mobile, Ala. • Hudson Falls, N. Y.

"The Oldest Name in Paper Bags"

Personals

Barney Tucker, since their establishment in 1947, general manager of the London, Ky. branches of **Knoxville Fertilizer** and **Dean-Planters Warehouses,** has been made vice president of both parent companies. He originally joined them in 1938.

* * *

J. R. Simplot has a new mineral named after him . . . Simplotite, a new mineral found in a mine he owns.

Ashcraft-Wilkinson Company, sales agents for Duval Sulphur & Potash Company, has named Wendell W. Hoover, Jr., as sales representative in the Mid-West, according to Warren C. Huff, district manager, Columbus, Ohio.

Potash Company of America announces the appointment of **F. Edward Smith, Jr.,** as assistant to the vice president in charge of sales. He will continue to serve his territory until his successor is named. **G. A. Woods'** resignation was announced at the same time.

* * *

Reliance Fertilizer & Lime, Norfolk, Va., announces the election of **Earl I. Greene** as vice president and general manager.

J. H. Culpepper, vice president of the **Smith-Douglass Co.,** has announced the appointment of **J. R. Stiffler** as S-D advertising manager. A native Iowan and graduate of St. Ambrose College, Stiffler joined Smith-Douglass in 1953 as advertising assistant.

President of the Norfolk Advertising Club, he will be responsible to Smith-Douglass for coordination of advertising and sales promotion of the corporation's divisions, which, in addition to fertilizer, include the Coronet Phosphate Co., Smith-Rowland Co., San Jacinto Chemical Co., and Nutro lawn and garden plant foods.

The fertilizer industry again this year will be given an opportunity to lend its support to 4-H Club work on a nation-wide basis, according to **John V. Collis,** president of the **Federal Chemical Company** of Louisville, Ky.

Mr. Collis, who is a member of the 4-H Builders' Council of the National 4-H Club Foundation, has announced plans for a program to

John D. Zigler who has been appointed general manager of the plant food division of International Minerals & Chemical. For the past two years Mr. Zigler has been operating manager of the division, supervising sales and production at the division's 26 chemical fertilizer plants.

raise funds within the fertilizer industry in behalf of the work of the National 4-H Club Foundation.

Mr. Collis is a director of the National Plant Food Institute and is active in several companies and associations.

* * *

The Red Star Fertilizer Company, Sulphur Springs, Texas, announces

R. F. White, who has been appointed sales representative in North Georgia, Northeast Alabama and East Tennessee for Southern Nitrogen Co., Savannah, Ga. His experience dates from 1948 when he joined Armour in the Northeast Georgia territory. He has since been with Southern Fertilizer and Chemical and Chilean Nitrate.

the appointment of **Archie T. Edwards** as general manager.

Mr. Edwards replaces **Arnold Neumann** who resigned August 15, to become associated with The **Longhorn Construction Company** of Sulphur Springs, Texas.

* * *

W. E. Jones, formerly production engineer has been appointed to the position of manager, fertilizer division, **Northwest Cooperative Mills,** St. Paul, Minn.

* * *

Judson Bemis, executive vice-president of the **Bemis Bro. Bag Company,** has announced the appointment of **A. N. Weeks** as director of production. He will succeed **A. H. Clarke,** who is retiring January 30.

Dr. William S. Emerson who has joined American Potash & Chemical as manager of research at the company's Whittier (Calif.) Research Laboratory. He formerly was with Monsanto Chemical Company.

Mr. Weeks was formerly manager of Bemis' multiwall paper bag plant at East Pepperell, Mass. He has been succeeded as manager by **F. G. Bemis, Jr.**

* * *

Hubert B. Vickery, head of the Department of Biochemistry at **The Connecticut Agricultural Experiment Station,** has been officially notified that he has received the Charles Reed Barnes life membership in the American Society of Plant Physiologists.

Appointment of **Charles C. Doane** to the Department of Entomology staff was announced by **director James G. Horsfall.**

* * *

United States Testing Company, announces the appointment of **William T. Sample** as an agronomist in their Memphis, Tennessee Branch.

* * *

W. R. Grace & Co. has elected **Marlin G. Geiger** an executive vice president in charge of the chemical group composed of the company's seven chemical divisions. He will be succeeded as president of the **Davison Chemical Company** division by

LINK-BELT HELPS BREA NITRATE PLANT GET "on stream"

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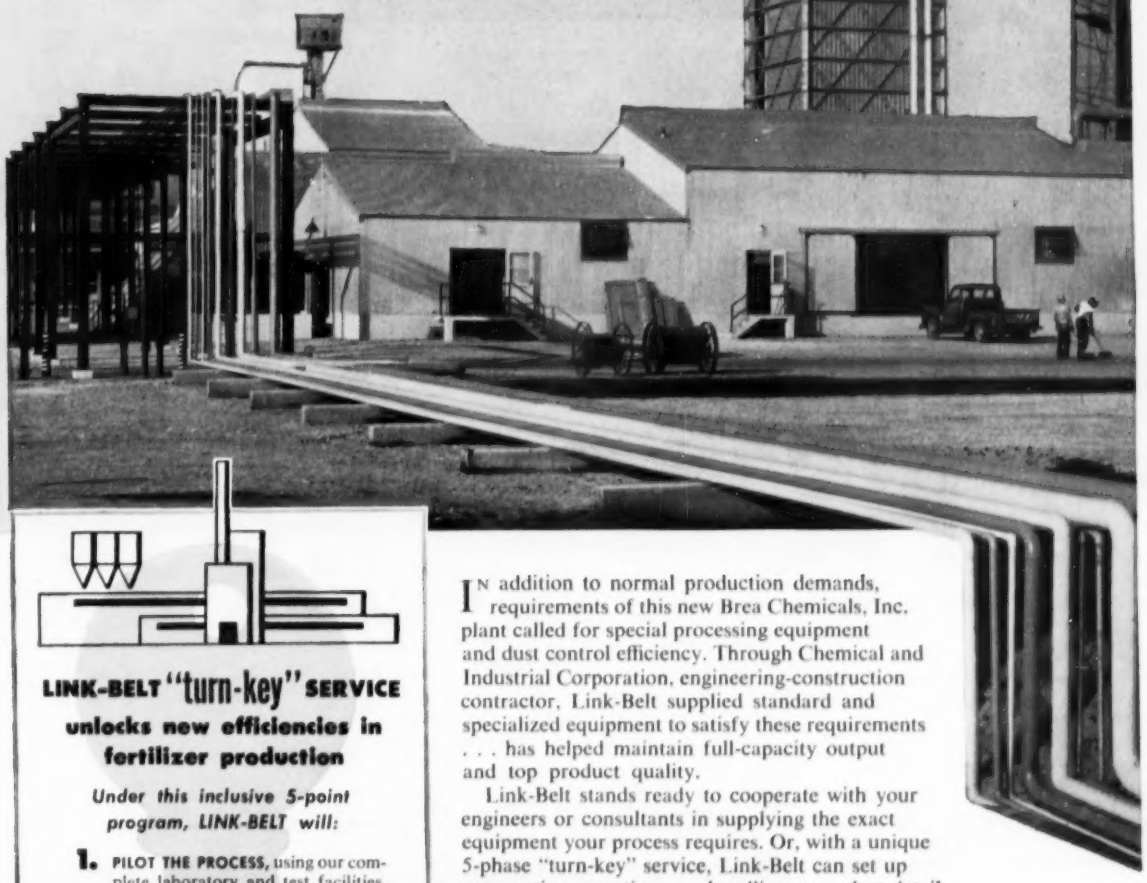

LINK-BELT "turn-key" SERVICE unlocks new efficiencies in fertilizer production

Under this inclusive 5-point program, LINK-BELT will:

1. **PILOT THE PROCESS,** using our complete laboratory and test facilities.
2. **DESIGN THE SYSTEM** as an efficient, integrated operation conforming to your exact needs.
3. **FABRICATE THE EQUIPMENT.** Link-Belt makes a complete line—will also supply special requirements.
4. **ERECT THE PLANT,** providing crews and supervisory service.
5. **START THE OPERATION,** with field engineers ready to make final adjustments.

IN addition to normal production demands, requirements of this new Brea Chemicals, Inc. plant called for special processing equipment and dust control efficiency. Through Chemical and Industrial Corporation, engineering-construction contractor, Link-Belt supplied standard and specialized equipment to satisfy these requirements . . . has helped maintain full-capacity output and top product quality.

Link-Belt stands ready to cooperate with your engineers or consultants in supplying the exact equipment your process requires. Or, with a unique 5-phase "turn-key" service, Link-Belt can set up your entire operation . . . handling every last detail under a single, all-inclusive contract. To learn more of the savings this service can bring you, call your Link-Belt office. Or write for Book 2459.

LINK-BELT

PLANTS AND EQUIPMENT FOR THE FERTILIZER INDUSTRY

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14.147

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with sufficient potash

without sufficient potash

Today more and more farmers are realizing the importance of balanced fertilizers in raising healthier, more vigorous crops. Potash is a vital ingredient in balanced fertilizers because it increases plant resistance to disease and improves both yield and crop quality.

USP's high-grade muriate of potash has the highest K_2O content and is free-flowing and non-caking—important advantages in the manufacture of these modern fertilizers which help American farmers to better crops and better incomes.

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HIGRADE MURIATE OF POTASH 62/63% K_2O

GRANULAR MURIATE OF POTASH 60% K_2O MIN.

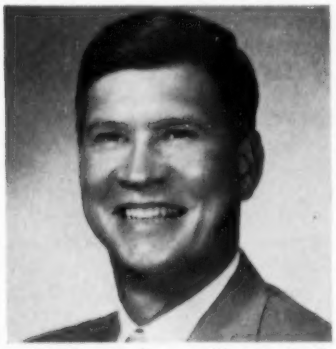
William E. McGuirk, Jr., formerly executive vice president of the Davison Division.

As chemical group executive Mr. Geiger will assume duties now being carried out by executive vice president **Hugh S. Ferguson** who becomes a member of the top echelon management group with corporate-wide responsibilities of which executive vice presidents **A. S. Rupley** and **J. C. Griswold** are also members.

* * *

Dr. Charles E. Waring, formerly vice president in charge of research and development of the Davison division has been named a vice

Walter B. Gillette who has been named to the newly-created position of sales manager for the Bag division of Virginia-Carolina Chemical, 99 Park Avenue. He is known as "Bo" to industry friends.



president of Grace Chemical Research and Development Company division and will also serve as a vice president of the parent company.

* * *

Dr. J. D. Clary has been named production superintendent of the Florida Phosphate division of the **Davison Chemical Company** division of W. R. Grace & Co. Dr. Clary has been with the company since 1951, most recently as assistant works manager at Curtis Bay, Baltimore.

* * *

Pacific Coast Borax Company division of United States Borax & Chemical Corporation has announced the appointment of **Lloyd L. Fusby** as Western manager, and **Roger W. Hinchman** as general sales manager.

* * *

Paul B. Sears, professor of conservation at Yale University and president of the American Association for the Advancement of Science, has been elected to the board of directors of **Virginia-Carolina Chemical Corporation.**

* * *

Sinclair Chemicals, Inc. have an-

K. T. Seaborne who has been appointed sales manager of Cominco Products, Inc. according to an announcement by R. Hendricks, CPI president. Mr. Seaborne has been western sales manager for Consolidated Mining and Smelting Company of Canada Limited at their Vancouver office since 1953.

nounced the appointment of **Elwyn C. Weiss** as sales representative, Nitrogen Products division for the territory of Indiana, Michigan and Ohio, with headquarters at Winona Lake, Indiana.

* * *

Two new appointments in the Kansas City branch of **Fulton Bag & Cotton Mills** have been announced by **Jason M. Elsas,** vice president and general manager of the company's Bag division. **James R. Jones** has been appointed sales representative for the Kansas City area,

Appointments in the Raymond Bag, Multiwall Bag Division of Albemarle Paper, have been announced by J. R. Clements, vice-president of Raymond. T. H. Bacon, left, assistant sales manager, with offices at Middletown, Ohio; C. W. Ingham, center, director of research and development, and E. H. Pyle, right, packaging engineer, both headquartering in Chicago.

Sinclair Chemicals has announced the appointments of Maurice E. Peterson, left, as sales representative, nitrogen products for Iowa, Minnesota and other neighboring areas. Right, Dr. Leo E. Orth, agronomist in nitrogen products at Chicago headquarters.

Commercial Solvents has named A. W. Kinnard III to its expanding agricultural chemicals marketing and distribution organization in the Southeast, headquarters of which are at the Company's Atlanta, Georgia, office. He will reside in Tampa, with sales responsibilities covering the state of Florida. He was formerly with the Nitrogen Division of Allied Chemical and Dye Corporation.

northeastern Kansas and northwestern Missouri. **Ron A. Euler** has been named to the post of sales representative in southern Kansas and southwestern Missouri.

* * *

R. L. Logan has been appointed manager of the Niagara Falls electrochemical plant of the Potash division of **International Minerals & Chemical. William A. Haigh** has been appointed to the marketing staff of their Plant Food division as supervisor of sales methods and training.

* * *

Richard G. Hartman has been appointed sales representative for the **Zonolite Company,** covering the territory of southwestern Ohio, southwestern West Virginia, eastern Kentucky and several counties in Southern Indiana.

* * *

Joseph W. Venable has been named technical assistant to **Charles T. Harding,** manufacturing department general manager of **Virginia-Carolina Chemical.**

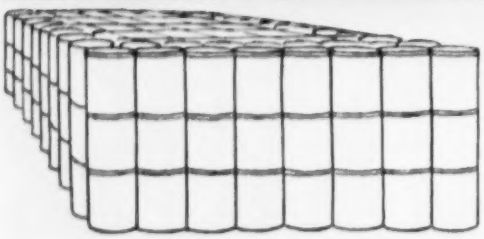
* * *

Maywood W. Chesson, Jr. has been named triple superphosphate manager, in charge of **American Cyanamid's** Brewster, Fla., plant, now under construction.

Use Fulton **WPPL*** Bags . . . store empties in less than 2½% of the space required by rigid containers!

*WATER-PROOF PAPER LINED

By: A. W. Moenkhaus
Sales Manager, Bag Division
Fulton Bag & Cotton Mills
St. Louis, Mo.



Empty Rigid Containers —Capacity 25,000 lbs.

Empty Fulton WPPL Bags —Capacity 25,000 lbs.

• It takes approximately 480 cubic feet of warehouse space to store enough empty rigid containers to hold 25,000 pounds of chemical fertilizer. But it takes only 11⅓ cubic feet to store one bale of Fulton's WPPL (Water-Proof Paper Lined) Bags. And this single bale holds 250 of the 100-pound bags—enough to ship 25,000 pounds of the same material.

• For complete, low-cost protection of your chemical products, always specify Fulton WPPL bags. You have your choice of styles—economical burlap or cotton laminated to a selection of papers or polyethylene (which is acid and alkaline resistant). If you have an unusual packaging problem, we'll find a Fulton bag to fit your needs . . . or we'll design one!

Why pay more? Fulton WPPL bags feature:

- Protection against moisture, both in transit and storage.
- Easiest handling, most economical storage.
- Lowest possible cost.

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PACIFIC NORTHWEST PROJECT

TURNS A LOSER INTO A WINNER

Five years ago the Blaine Marks' farm near Sandpoint was a loser. It grew a skimpy crop of grain and a wispy half ton of hay to the acre. In 1956 it is a show place of Bonner County with fat yields of oats, heavy cuttings of clover, and pasture knee-deep to an expanding dairy herd.

The transformation has come about through a combination of commercial fertilizer, recommended improved seedings, and farm-management practices tailored to practical progress. The fertilizer program was started two years ago by the Pacific Northwest Plant Food association. Marks' farm was chosen for a demonstration by the association in cooperation with the Sandpoint chamber of commerce; Walter McPherson, county agricultural agent; Tom Brackney, superintendent of the University of Idaho branch experiment station; the soil conservation service; and other agencies.

Development of the farm from a run-of-the mill 80 to an acreage that makes money was shown the public on a tour in August. It was the big field trip, but Marks says scarcely a day goes by without some visitors who want the low down on the miracle.

"More than $2.50 was returned in 1955 for every dollar invested in fertilizer," McPherson said. Marks nearly doubled hay production from 1954 to 1955. Carrying capacity of pastures increased from half a cow to two cows per acre. Fertilizer and sprinkler irrigation have made an amazing improvement. Still greater changes are probable as the farm continues to use recommended methods."

Left to right: Norman Hibbert, Pac. N.W. Soil Improvement Committee; Blaine Marks; Leon S. Jackson, secretary of the Association.

Marks got his foundation in farming as a boy at Rigby in eastern Idaho. For a number of years he was a worker at the atomic plant, Richland, Wash. While there, he maintained his hand at farming by operating 26 irrigated acres at Kennewick. In 1951 he sold that place and bought the Sandpoint farm.

Early results were grim. "On one field the yield was about eight bushels an acre," he said. "The average was between 10 and 20. It wasn't much. It looked like we were going to be sorry we ever left Kennewick."

Mr. and Mrs. Marks have nine children. Eight-bushel grain doesn't take care of 11 people. Marks got a job as a construction worker and pecked at his farm part time.

The opportunity to become a demonstration farm nad strong appeal. Marks agreed to go along. There was no place to go but up. "I wasn't convinced it would fit the place," he said, "but I hoped it might. I didn't have anything to lose. I think it turned out great."

As a starter the plant-food association chipped in $1000-worth of fertilizer. The cost of fertilizer in 1956 is shared by the chamber of commerce, Kiwanis club, and others. For the third year of the demonstration, Marks has agreed to buy the recommended amount of fertilizer. It will be about $700.

The pasture of University of Idaho mix is grazed in rotation plots by 23 head of dairy stock. Marks started his dairy herd in 1953. He is gradually adding better animals. He built a milking parlor to meet grade A specifications.

His sprinkler irrigation system pumps water from a slough created by Albeni Falls dam. Even before the fertilizer program landed in his lap, he said, sprinkler irrigation was improving yields of pasture and hay. Yields, though, were not good. Twenty tons of commercial fertilizer in two years seemed to be just what the doctor ordered.

Brackney, Sandpoint station superintendent, said the irrigated pastures are the equal of anything in Bonner County.

Grant H. Braun, Portland, chairman of the soil improvement committee of the Pacific Northwest Plant Food association, said during the tour, "We are very pleased at what is going on here." Leon S. Jackson, Portland, association secretary; and N. W. Hibbert, Yakima, member of the soil improvement committee, seconded the sentiment.

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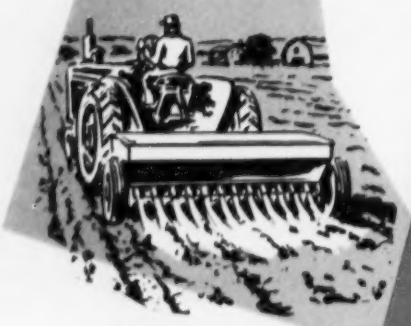
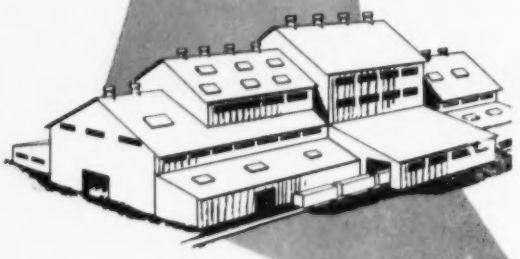
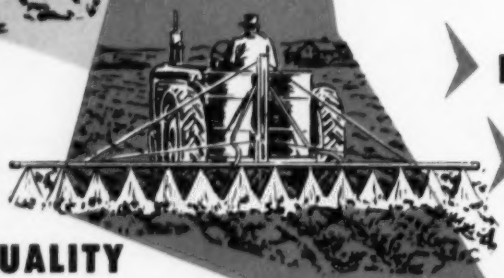
Stimulate fertilizer sales with the addition of
Tennessee's Nutritional Manganese Compounds.







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MANGANESE SULFATE
65% Mn SO_4. Designed specifically for inclusion in mixed fertilizer or direct application to the soil.

NU-M
Minimum 41% Manganese as metallic. A neutral, finely divided, water insoluble form of nutritional Manganese designed specifically for direct foliar application as a spray or dust or in combination with other foliar applied pesticides.

MANGANOUS OXIDE—TENNESSEE NU-MANESE
Minimum 48% Manganese as metallic. For fertilizer mixing, direct foliar application, direct soil application, and animal feeds.

SPRAY-DUST MIXTURES
Tennessee's Nu-Z, Nu-Iron, Nu-M and Tri-Basic Copper Sulfate are especially suited for use in preparing nutritional and fungicidal spray and dust mixtures and for use in mixed fertilizers.

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TENNESSEE CORPORATION

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LIQUIDS

Standard Steel Mfg. Co., Inc., of Indianapolis has engineered and built up this "package liquid fertilizer mixing unit" which is completely self contained and automatically meters and weighs all raw materials for batch mixing. To begin operation, it is only necessary to bring in electric current and hook up hose lines to raw materials in tanks, cars or trucks, they say, and the unit can be in operation the same day it is delivered. It has a mixing capacity of 120 tons of liquid fertilizer every eight hours with one operator, who can be trained completely in 8 hours, according to the manufacturer.

The mixing unit is skid mounted and when completely assembled is 18 feet long, 8 feet wide and 14 feet high. All parts have been selected to handle the corrosive action of liquid fertilizer mixes. The mixing unit will handle dry-form potash, aqua ammonia, liquid urea-ammonium-nitrate, phosphoric acid and other liquid fertilizer additives. The unit can use anhydrous ammonia for direct batch mix into complete liquid fertilizers without converting mechanisms.

Mixing units of the Standard Steel Mfg. Co. were in operation throughout the East and Mid-West last season, and arrangements to inspect a mixing unit in operation can be made by writing Standard Steel.

Nitrogen Div. Announces 5 Concentrated Solutions

Production of five new concentrated nitrogen solutions which will give fertilizer manufacturers substantial savings on freight costs was announced today by Nitrogen Division, Allied Chemical & Dye Corporation.

According to M. E. Hunter, vice president, most of the new solutions contain less water than those currently available, and, in addition to freight savings up to 7%, will permit manufacturers to produce better quality fertilizers with a higher nitrogen content from solutions. One of the new solutions is the first ever available designed specifically for making granular fertilizers and which can be used all year round because of its low salting-out temperature.

In addition to the above Nitrana type solutions, there are included two new Urana type solutions, giving more flexibility to those manufacturers producing semi-granular and organic nitrogen fertilizer grades.

By technically "squeezing" water out of the solutions, Mr. Hunter explained, there is less water to ship and less to remove by the fertilizer manufacturer. The new solutions will permit more satisfactory output from existing equipment in plants making either granular or non-granular fertilizers. It will also greatly improve the condition of granular fertilizers.

The production and sale of higher-nitrogen granular fertilizers has grown rapidly in recent years as farmers recognize the benefits of their dustless, non-caking qualities. The new solutions are designed to help meet this demand by easing the production difficulties encountered in the trend to granulation, in addition to improving the quality of all regular grades.

Nitrogen solutions were originated by Allied Chemical in 1932 and are now standard in the fertilizer industry for the production of mixed fertilizers.

TVA Producing And Testing Liquid Fertilizers

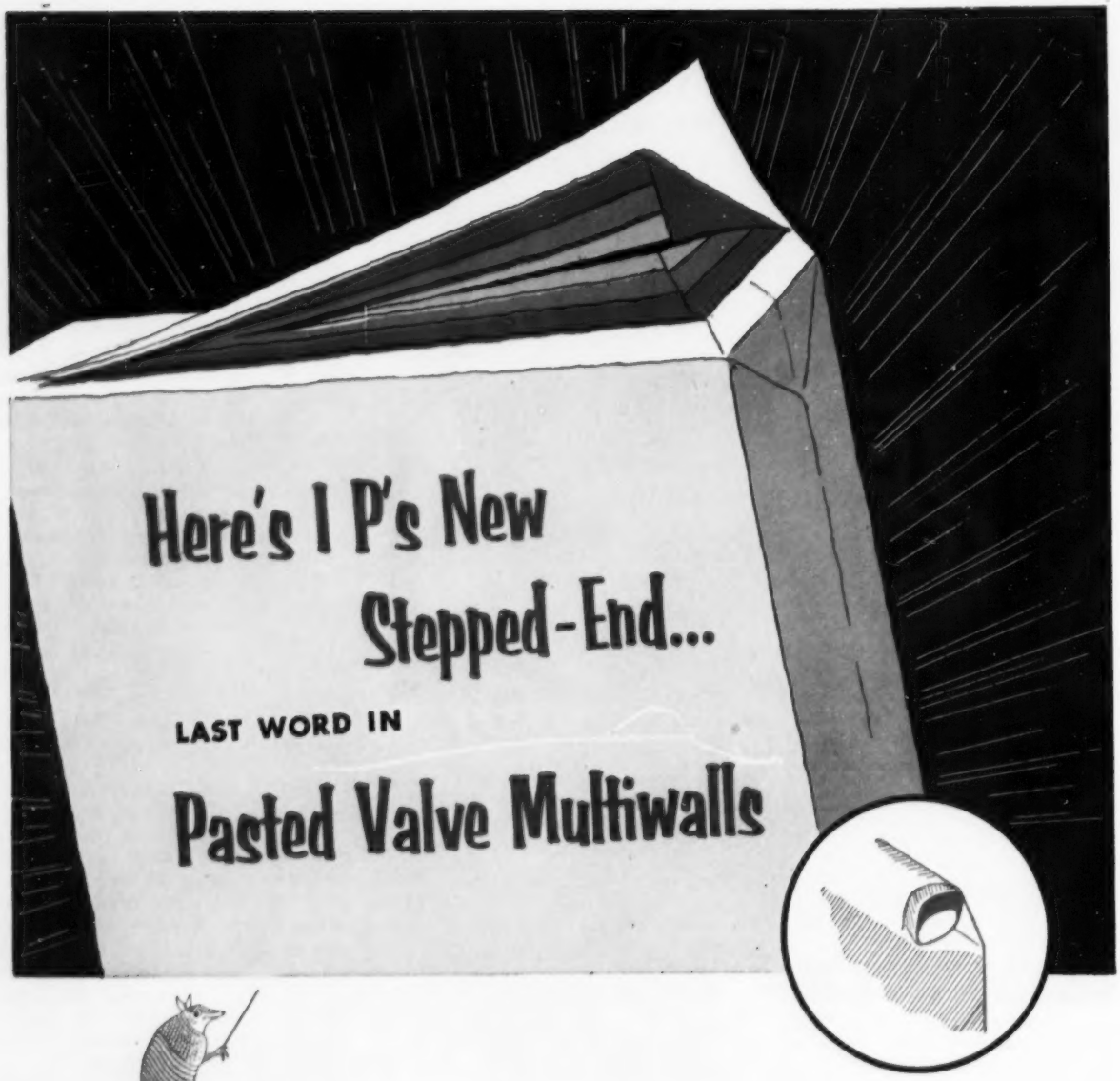
TVA now is producing liquid fertilizers on an experimental basis and on a pilot-plant scale. Productive capacity is about 10 gallons an hour and the entire output is being used in tests and experiments.

TVA said that of the liquids undergoing tests, "superphosphoric acid," appears to have unusual possibilities. It is between 40 and 50 percent more concentrated than the phosphoric acid commonly being produced for fertilizer or chemical use. The superphosphoric acid will make a liquid fertilizer containing considerably more plant food than the usual liquid mixture; liquid fertilizer containing 12 percent nitrogen and 36 percent phosphate—a total plant food content of 48 percent—can be made with superphosphoric acid. The comparable grade now on the market contains 8 percent nitrogen and 24 percent phosphate. Another important thing about the superphosphoric acid, TVA said, is that due to its higher concentration shipping costs for the strong acid would be substantially less than for phosphoric acid commonly in use.

Another liquid concentrate of interest to TVA is made with ammonium metaphosphate, a new TVA fertilizer. The solid ammonium metaphosphate is 90 percent plant food, but it is difficult to produce in solid form. Experiments show it can be made in solution form more easily and that the resulting liquid is not only concentrated but also stable at low temperatures. Solutions of ammonium metaphosphate contain as much as 52 percent of combined nitrogen and phosphate plant food.

Liquid Fertilizer Hose By Hewitt-Robins

A new hose has been developed by Hewitt-Robins, Inc., to dispense liquid fertilizer from storage tanks. The hose is made with a synthetic rubber lining resistant to ammonium nitrate solutions. The outer covering is green neoprene highly resistant to sunlight and oxidation. The green color conforms with the coding system adopted by the Anhydrous Ammonia Institute for ammonia transfer hose. The hose carcass is reinforced with a special heavy braid of cotton yarn to provide strength and durability. A static dissipation wire is built into the hose wall and bonded to the couplings to equalize static charges between the tank and vehicle.



Real Flexibility—Each ply is full-pasted to itself—but not to the other plies.

Armored Strength—The accurate overlapping of paper tube ends together with the built-in flexibility gives chain-mail strength to both ends of the bag.

New Full Wrap-around Valve Sleeve—This complete sleeve, combined with armored strength and real flexibility, means stronger, more sift-proof and cleaner bags.

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an on-the-spot report from long-awaited

Supervisors Safety Training Course

Success of Fertilizer Safety Section's long-planned series of regional safety training programs for supervisors was assured when the industry examined and approved a "pilot" course at Wilmington, N. C., August 16-17.

Capacity attendance greeted the "premiere," a fast-moving two-day session that reflected the careful study and planning which went into preparation of the course.

Fifty-one men—mostly superintendents and foremen—from 28 plants in four Atlantic coast states were registered, plus ten safety specialists and other interested persons. Early expectations for 30 participants were realized with the first announcement letter, and plans for securing additional students were stopped when response from a follow-up letter indicated that the maximum goal of 50 would be reached without difficulty. Enrollment was limited to this number to encourage audience participation and to facilitate breakup into small discussion groups for specific topic study.

Curtis A. Cox (assistant manager of manufacturing for Virginia-Carolina Chemical Corp., Richmond, Va.), chairman of the Fertilizer Section of the National Safety Council, was unable to be on hand for the meeting after all his effort to assure its success.

E. O. Burroughs, Jr. (safety director for F. S. Royster Guano Co., Norfolk, Va.), vice chairman of the section, conducted the program and did a masterful job of guiding the course along on schedule.

Behind the scenes but seldom out of sight was W. C. "Billy" Creel, safety director for the North Carolina Department of Labor, also an executive committeeman for the Fertilizer Section. The experience and know-how he has gleaned from directing a highly-successful fertilizer plant safety drive in North Carolina during the past several years was quite evident in the make-up of the conference.

Another Fertilizer Section executive committeeman on hand for the occasion was Vernon Gornto (safety director for Smith-Douglass Co., Norfolk, Va.), former chairman and one of the pioneers in the formal safety movement of the industry.

General theme of the meeting was instruction of the supervisors in latest techniques of accident prevention, and training them in setting up safety programs in their own plants. The importance of the supervisor in the plant safety program and the ways he can reach the worker effectively were stressed throughout the course.

Topics on supervisory safety training included "The Supervisor as a Teacher and a Leader," "Human Feelings in Teaching Safety" and "Putting Training Methods to Work."

In addition to these topics, basic subjects were "Plant Inspection," "Accident Investigation" and "Safety Committees." Also highlighted was "Occupational Health" developed along the lines of practical problems in the typical fertilizer plant.

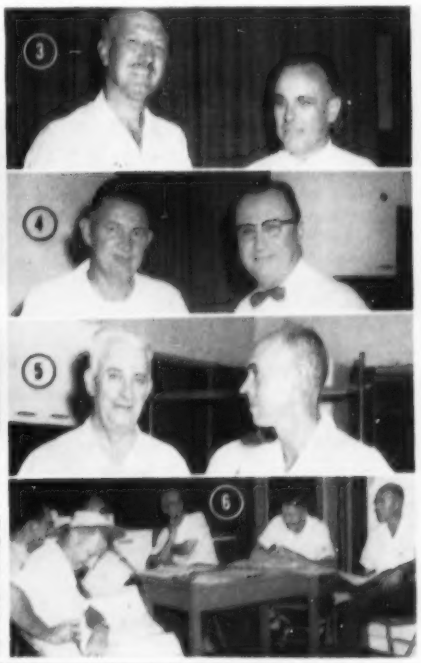
Sessions were all-day affairs, with only a brief recess for lunch, and frequent reference was made to the packet of safety materials given each man as he registered; included were carefully selected posters, pamphlets, statistics and booklets from National Safety Council, U. S. Department of Labor, insurance companies and other private and public sources.

Along with this packet, each registrant received a notebook containing a full outline of the entire program and copies of talks and discussions to be presented, complete with a generous supply of note paper which he was encouraged to use throughout the sessions.

The course was especially designed as a "package" presentation so that it can be conducted with the least possible variation in other areas later. It is organized so that qualified instructors can be recruited in any section of the country to join the Fertilizer Section's executive committeemen from that area as leaders in the training program.

North Carolina was chosen as the site of the pilot course for several reasons: State officials concerned with safety have had several years of specialized experience in their intense campaign with the state's fertilizer industry. These state officials have lent their full support to the formation and growth of the Fertilizer Section in the National

1, W. C. Creel, Vernon Gornto and E. O. Burroughs, Jr., executive committeemen who were on hand for the program. 2. Here's part of the group of superintendents and foremen whose participation made the course such an outstanding success. 3. Emil Chanlett and E. O. Burroughs, Jr. (CF staff photo). 4. Billy Creel and H. S. Baucom (CF staff photo). 5. Vernon Gornto and Bill Shaw (CF staff photo). 6. Leaders and instructors staged mock safety committee meeting (CF staff photo).



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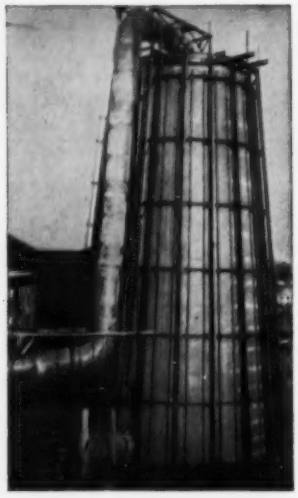

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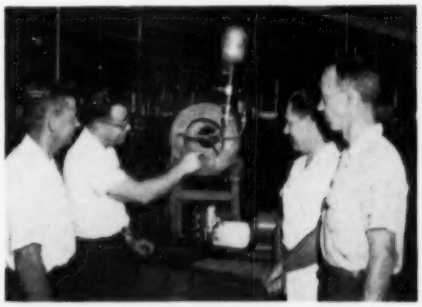

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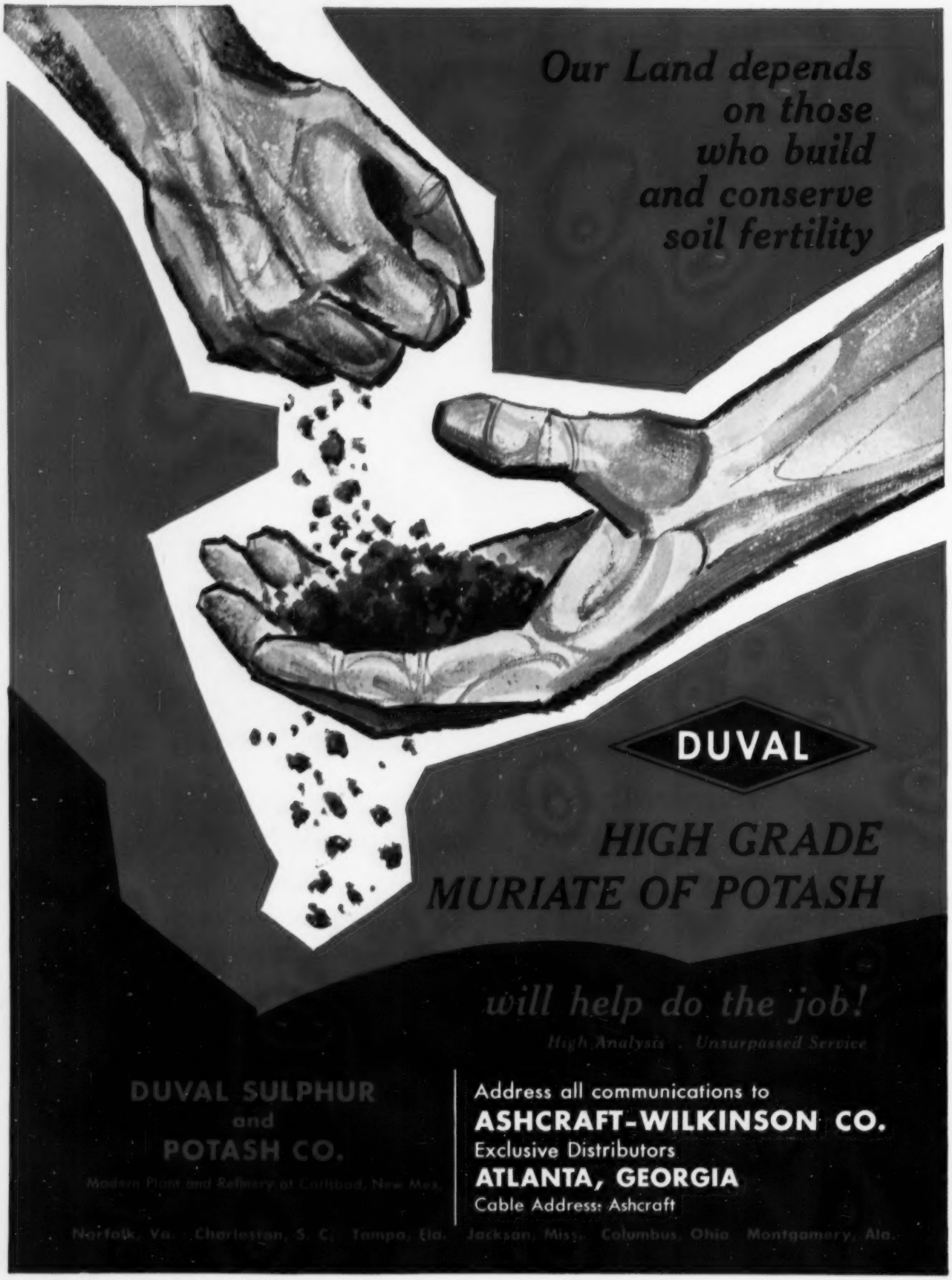
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Safety Council. And finally, there is a concentration of fertilizer plants in the coastal area of the state that includes most of the multi-plant operators whose support will be needed to extend these courses to other regions.

In addition to the men already mentioned, many others contributed heavily to the success of the initial presentation of the program. Among these were the following, who served as advisors, planners and "faculty" for the Wilmington conference: Emil T. Chanlett, associate professor of Sanitary Engineering at University of North Carolina's School of Public Health, who has had wide experience in teaching training methods and is an expert in the field of occupational health; Dr. Samuel Graham, health officer for Martin County, N. C.; Harry Donaldson, industrial hygienist for the N. C. State Board of Health; H. S. Baucom, safety director for the N. C. Industrial Commission; and Bill Shaw, safety inspector for the N. C. Department of Labor.

Major program topics, with a brief description of their handling, were as follows:

Opening: highlighted by film "The Secret of Supervision."

The Supervisor as a Teacher and Leader: Lecture illustrated with sound slide film "Teaching Safety on the Job."

The Accident Program: introduced by questionnaire-quiz; correct answers and discussion followed.

Plant Inspection: illustration of hazards with typical plant flow-chart, followed by small-group discussion of familiar danger spots.

Accident Investigation: Illustrated lecture on need for formal report, methods, and composition of investigation committee.

The Safety Committee: description of organization, functions and problems, with mock committee meeting by leaders.

The Use of Movies and Visual Aids: discussion of sound and slide films, and use of home-made film slides of plant.

Occupational Health in Fertilizer Plants: Talk on specific toxic material exposures in fertilizer plants, and recommended controls.

Human Feelings in Teaching Safety: Idea developed with slide films "People Are All Alike" and "Everybody's Different."

Highlights of Fertilizer Plant Accident Causes: individual symposiums on housekeeping, machine guarding, handling materials, and fire prevention, followed by separate group discussions of each subject, and summary reports of group recommendations.

Putting Training Methods to Work: Finale reiterates theme of program, using slide film "Teamwork for Safety," and summarizes methods.

For having piled up a safety record of more than nine years without a lost-time accident, some 50 employees of the Chatham, Ontario fertilizer works of Canadian Industries Limited were feted recently at the William Pitt Hotel at Chatham. The achievement won for them the second successive C-I-L prize, highest award under the company's no-accident record plan. In photo above, Lorna Hands accepts an individual award from H. Greville Smith, (right), president of C-I-L, for her contribution to the safety record. At left is V. B. Lillie, general manager of C-I-L's agricultural chemicals division.

Blue Valley Announces New Granulating Units

Keeping pace with the growing fertilizer industry, the Blue Valley Equipment Manufacturing and Engineering Company, Topeka, Kansas, has announced the addition of two new sizes of granulating units to their line of fertilizer plant equipment.

A total of 4 different units are now built by Blue Valley, with each unit designed for various plant capacities. These four units are built for 12, 18, 24, and 36 average ton-per-hour sizes.

Blue Valley officials point out that their four different granulating units have been designed to fit the plant needs and finances of any fertilizer plant. They also point out that all 4 units are built for either single or double screening, and for either batch mixing or continous ammoniation.

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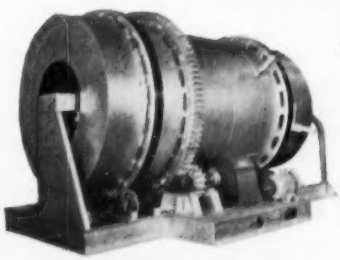

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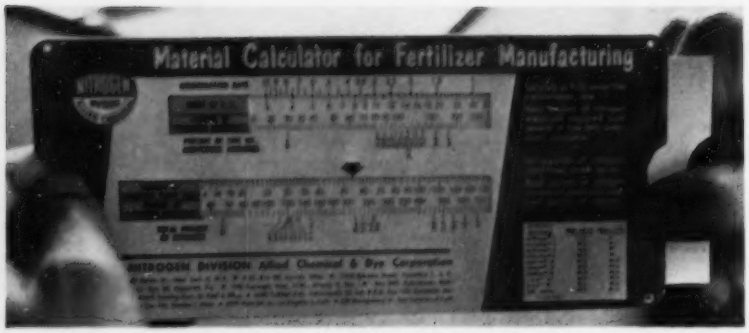

A simple device to determine the pounds of raw materials required for any fertilizer mixture which is being distributed free by Nitrogen Division, Allied Chemical & Dye Corportation. The new material calculator, designed by a member of Nitrogen Division's sales department, consists of special slide rules built into a stiff cardboard frame. By manipulating the slides, a mixer can compute the amounts of various types of nitrogen solution, superphosphate, and potash materials that will be needed to manufacture any fertilizer grade. The calculator also has a slide rule for figuring ammoniation rates, as well as a standard slide rule. Rugged and compact, the handy device fits into a back pocket. By writing on company letterhead any fertilizer mixing company will receive free a material calculator. Address inquiry to: Public Relations Department, Nitrogen Division, Allied Chemical & Dye Corporation, 40 Rector St., N. Y. 6, N. Y.

55 RURAL COUNTIES TO GET SPECIAL DEVELOPMENT AID

Fifty-five counties named by agricultural agency leaders in 24 states as pilot counties in the Rural Development Program will receive special educational, technical, administrative, and farm credit aid in moving forward with balanced agricultural, industrial and other development, Secretary of Agriculture Ezra Taft Benson announced today. Nearly half of these counties have just been brought into the program.

Secretary Benson listed the new pilot counties as follows: **Alabama,** Chilton and Fayette; **Georgia,** Meriwether, Wayne, and Hancock; **Indiana,** Perry; **Louisiana,** Aveyelles, Franklin, and Washington; **Maine,** Washington; **Michigan,** Delta and Mackinaw; **Minnesota,** Carlton, Hubbard, and Itasca; **Missouri,** Taney and Douglas; **Ohio,** Guernsey; **Oklahoma,** Cherokee; **South Carolina,** Chesterfield, Berkeley, and Bamberg; **Texas,** Camp-Franklin-Titus area and Shelby-San Augustine area; **West Virginia,** Raleigh; **Wisconsin,** Sawyer. One county in **Illinois** and two counties in **Tennessee** will be added to the list.

In addition, twenty-eight counties already participating in the Rural Development Program will also receive this special assistance. They include: **Arkansas,** Phillips, Van Buren, and Ouachita; **Georgia,** Twiggs; **Kentucky,** Butler, Metcalf, and Elliott (trade area centers); **Maryland,** Garrett; **Mississippi,** Covington, Holmes, and Tippah; **Missouri,** Dent; **New Mexico,** Sandoval and Santa Fe; **North Carolina,** Bertie, Anson, and Watauga; **Ohio,** Monroe; **Oklahoma,** Choctaw; **Pennsylvania,** Fayette; **Tennessee,** Grainger, Hardin, Macon; **Texas,** Cherokee; **Virginia,** Cumberland and Carroll; **West Virginia,** Lewis; **Wisconsin,** Price.

The Rural Development Program is combining the resources, skills and leadership of private organizations, farm groups and businesses in a drive for more efficient farms, greater job opportunities and better farm living in underdeveloped rural areas. Local, state and Federal governmental agencies furnish assistance to local and state programs.

In submitting recommendations last year for a program to strengthen family farming in low-income rural areas, Secretary Benson said that pilot operations should be launched in not less than 50 rural counties where "practical experience can be gained in a limited number of areas and those elements of the program which proved most successful can be utilized as the program is broadened. In the pilot operations, efforts will be made to develop the best practical program of action, having in mind the people, the resources, and the whole range of opportunities."

Through allocations to the 24 States with pilot counties (called demonstration counties in some instances), the Federal Extension Service has provided funds for the salaries and expenses of additional extension workers to assist with programs in these counties.

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3% OF FARMS—25% OF ACREAGE DO ONE THIRD OF FARM VOLUME

A preliminary analysis of information from the 1954 Census of Agriculture indicates that family farms continue to be the dominant type of operation, according to Acting Secretary of Agriculture True D. Morse.

The proportion of family farms to the total number of farms in the United States has held steady in recent years. There has been no change in the proportion of the total number of farms operated by families in the last 15 years.

The Acting Secretary pointed out also that in 1954 family farms in the United States produced about the same share—roughly two-thirds—of the total agricultural output as in 1940. They control approximately the same proportion of the total acreage in farms as in 1940.

In 1954, family-operated farms comprised about 97 percent of all farms in the U. S. "Large-scale" farms represented only about 3 percent of the total.

Also, family farms controlled about three-fourths of all land in farms in the United States, both in 1954 and 1940.

The percentage of farmers who are full or part owners of the farms they operate stood at slightly more than 75 percent in 1954, an increase of 2 points over 1949. This is an all-time record high.

Farm tenancy is at an all-time record low.

A comparison of the number of family workers (farmers and members of their families) and hired workers in agriculture for the last 15 years also indicates the increasing strength of family-type farming in the United States, Mr. Morse said. Because of mechanization, new crops and chemicals, and other improvements in production, the number of all workers in agriculture declined from 1940 to 1954. Numbers of hired workers, however, declined more rapidly. In 1954 there were 28 percent fewer hired workers in American agriculture than in 1940. Increasing mechanization allows family farms to operate with less hired labor than in previous years.

Farms have increased in size from an average of 174 acres in 1940 to 242 acres in 1954, an increase of 68 acres per farm. Even so the farms continue to be family operated, Mr. Morse explained.

Each year over one million acres of farm land are taken over by expanding cities, industries, roads, highways, airports and other non-farm uses. This, plus the growing size of farms, has reduced the number of farms.

Indiana Conference Purdue, Nov. 27-28

In 1954 Purdue University and the fertilizer industry cooperated in holding an Indiana Fertilizer Conference at Purdue. They are planning such a conference for this year, to be held at the Purdue Memorial Union on November 27 and 28. The program is designed particularly for fertilizer manufacturers and salesmen. However, others may find the conference of particular value to them, and they are welcome to attend.

The program is being developed with the help of representatives and members of the fertilizer industry but had not been released as we went to press.

OBITUARIES

J. Gibbs Ponder, 65, former Armour Fertilizer Atlanta Division manager, retired 1947, died September 17 in Atlanta.

• • •

Anderson W. Weaver, 76, founder and board chairman of Weaver Fertilizer Co., died August 24 in Farmville, Va.

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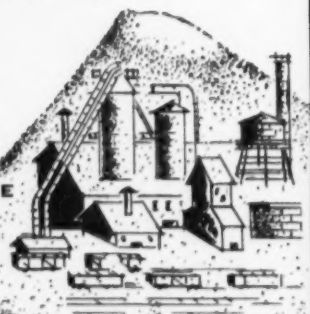

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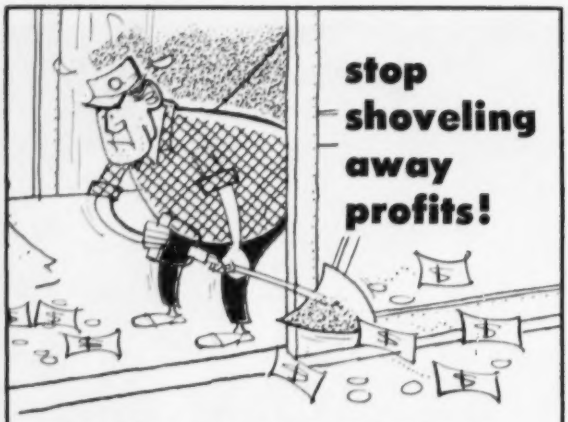

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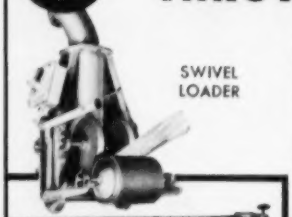

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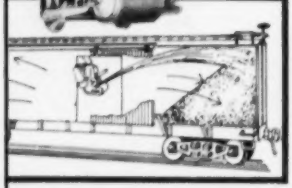

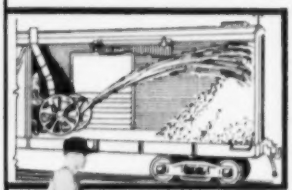

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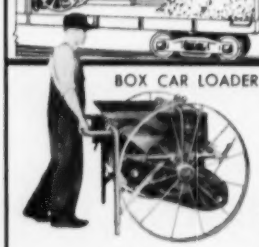

WHEEL-MOUNTED SWIVEL PILER

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Stop "shoveling away profits" with slow, inefficient methods of handling bulk materials. These powerful SA Centrifugal Action thrower units will load, trim and pile bulk materials faster, easier, and at much lower cost per ton. Ideal for the handling of grain, sand, salt, sugar, coal, crushed stone, fertilizer, chips, chemicals, or practically any dry bulk granular, or small lump materials up to 2" sizes. These units require the attention of only one man part time . . . eliminates operator exposure to dust and accident. Write today for Bulletins 854 and 948.

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62 Ridgeway Ave. Aurora, Illinois

CF Staff–Compiled TONNAGE REPORTS

FERTILIZER TONNAGE REPORT (in equivalent short tons) Compiled by COMMERCIAL FERTILIZER Staff

STATE	August 1956	August 1955	July 1956	July 1955	Apr.-May-June Quarter 1956	Apr.-May-June Quarter 1955	Jan.-Feb.-Mar. Quarter 1956	Jan.-Feb.-Mar. Quarter 1955	July December 1955	July December 1954	YEAR (July-June) 1955-56	YEAR (July-June) 1954-55
Alabama	.....	17,375[1]	19,925	14,888	470,247	413,345	342,857	433,390	167,372	272,068	1,029,030	1,114,238
Arkansas	.....	7,419[1]	11,869	9,292	157,191	136,306	141,981	134,588	60,299	59,997	359,471	330,781
Georgia	19,487	16,226	46,437	51,173	771,592	718,919	221,862	328,956	250,968	225,083	1,244,422	1,273,445
Kentucky	.....	.....	.....	.....	.....	.....	168,371	172,883	88,119	91,386	.....	524,488[1]
Louisiana	5,974	3,954	7,852	6,888	120,874	108,810	93,469	123,971	59,345	78,067	273,688	310,848
Missouri	.....	47,430[1]	26,842	11,433	208,976	205,628	241,126	189,351	360,210	268,257	804,441	682,690
North Carolina	.....	15,575[1]	14,968	12,117	742,370	740,666	681,897	825,492	225,182	264,475	1,649,449	1,830,633
Oklahoma	.....	9,629[1]	.....	3,423[1]	33,970	28,029	31,884	35,770	69,542	58,406	135,396	122,205
South Carolina	11,911	11,866	12,764	11,355	291,051	274,275	452,619	521,836	119,947	132,604	863,617	928,715
Tennessee	12,559	11,817	24,536	25,862	327,890	218,999	50,736	63,463	136,925	167,383	515,551	523,349
Texas	14,458	12,588	24,199	20,311	191,893	160,385	185,912	214,792	188,594	212,885	566,399	588,062
California	(reports compiled quarterly)				358,524	320,702	280,853	283,155	361,615	318,270	1,000,992	922,127
TOTAL	64,389	56,451	189,392	163,319	3,674,578	3,326,064	2,893,567	3,327,647	2,088,118	2,148,881	8,442,456	8,627,093

States Reporting Semi-Annually	January-June 1956	January-June 1955	July-December 1956	July-December 1955	Year (July-June) 1955-56	Year (July-June) 1954-55
Indiana	807,918	873,966	242,530	284,994	1,063,049	1,158,960
Iowa	231,873[1]	.....	.....	.....	.....	.....
New Hampshire	13,168[1]	.....	.....	.....	.....	.....
Washington	103,288	124,186	48,749	58,162	152,037	182,348
Total of States reported in upper table	6,568,145	6,653,711	2,088,118	2,148,881	8,442,456	8,627,093
GRAND TOTAL	7,479,351	7,651,863	2,379,397	2,492,037	9,657,542	9,968,401

..... (not yet reported) * Not compiled [1] Omitted from column total to allow comparison with some period of current year.

MARKETS

ORGANICS: The organic market recently strengthened as result of advanced prices on Tankage and Blood. A number of other organics for fertilizer use, effective September 1st advanced in price as previously had been announced. For example, Leather Nitrogenous Tankage advanced 25c per unit of Ammonia and a production of Activated Sludge advanced 20c per unit of Ammonia.

Current prices of Nitrogenous Tankage range from $3.00 to $4.25 per unit of Ammonia f.o.b. production point. Activated Sludge prices are now $2.95 and $3.00 per unit of Nitrogen and 50c per unit of APA, bulk, f.o.b. production point.

CASTOR POMACE: Producers are completely booked up through October at $35.00 per ton in bags f.o.b. New Jersey shipping points. Bids of $37.50 have been declined as the producers can not make available additional supplies until they purchase more Castor Beans and they do not know when this will be done. Production is at a very low level.

DRIED BLOOD: Unground Blood is indicated at around $5.50 to $5.75 per unit of Ammonia, in bags f.o.b. Chicago and around $4.50 to $5.00 f.o.b. New York. This represents a good advance over previous weeks.

POTASH: Movement is beginning to increase as the mixing season approaches. Prices remain firm and unchanged.

GROUND COTTON BUR ASH: Demand continues excellent. Supplies are available for shipment prompt through June. Current analyses vary from 38% to 42% K_2O.

SUPERPHOSPHATE: No unusual activity reported regarding this material. Supplies continue adequate with manufacturers building up stocks in anticipation of the fall and spring demand. Prices are firm and somewhat higher than last season.

PHOSPHATE ROCK: Prices continue firm and movement from the mines improving with stocks adequate.

NITRATE OF SODA: No change in prices of $51.25 in bags f.o.b. ports or $47.00 in bags f.o.b. domestic producing points has been reported. However, it is thought by many in the trade that there may be a reduction in prices in the near future in view of reduced prices of other forms of Nitrogen. Movement is entirely seasonal.

SULPHATE OF AMMONIA: Prices continue at $32.00 per ton at most mills with some Southwestern mills quoting $31.00 bulk and Midwestern mills $34.00 with delivered price and freight equalized.

GENERAL: Manufacturing, particularly in the Florida area, is increasing rapidly and in other areas rather slowly in preparation for the fall season.

PULVERIZED MASCOT LIMESTONE

REPRESENTATIVE ANALYSIS

Calcium content —$CaCo_3$ value 52.47%
Magnesium content—$CaCo_3$ value 44.23%
Calcium Carbonate —Equivalence 96.70%

MAGNESIUM LIMESTONE

EACH TON OF MASCOT LIMESTONE CONTAINS ABOUT

3.6 Lbs. Zinc
4.8 Lbs. Sulphur
.75 Lbs. Manganese
.05 Lbs. Copper

American Limestone Co.
Box 2389 Knoxville, Tenn.

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HERE is an opportunity for one with limited capital to lease a plant or purchase in midwest. Inquire Karr & Co.,—Realtors, 923 E. Broad Street, Columbus 5, Ohio.

POSITION WANTED: Fertilizer superintendent. Twenty years fertilizer experience. Twenty five years supervisory experience. Dry mixing preferred but experienced with complete plant. M. M. Ledbetter, 603 Crutcher St,. Nashville, Tennessee.

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WANTED: Position as manager or superintendent of fertilizer factory. Over twenty years experience in the manufacture of sulphuric acid (chamber type plant), superphosphate and mixed fertilizers. Have worked both union and non-union labor, both water front and inland plants, thoroughly familiar with repair and maintenance of plant; also new construction and machinery layout, etc. Can furnish excellent nationally-known references in both character and ability. Presently employed, good reason for changing. Box No. 39, c/o Commercial Fertilizer, 75 Third St. N. W., Atlanta 8, Ga.

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OF

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AS OF OCTOBER 1, 1956

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   Editor: Bruce Moran, 75 Third St., N.W.
   Business Manager: V. T. Crenshaw, 75 Third St., N.W.
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3. *Bondholders, mortgages, etc.:*
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Signed: ERNEST H. ABERNETHY, *President*

Sworn to and subscribed before me, a Notary Public, this 24th day of September, 1956.

MARY C. LAYMAN, *Notary Public.*

My commission expires February 29, 1960.

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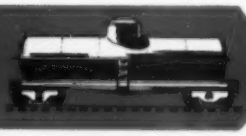
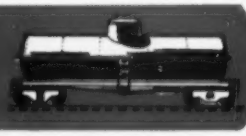
2 Anhydrous Ammonia



Phillips *66* Agricultural Ammonia contains 82% nitrogen. It's a convenient, economical source of nitrogen for mixed goods formulation. Tank car shipments are assured to Phillips contract customers by Phillips huge production facilities in the Texas Panhandle and at Houston, Texas.

3 Nitrogen Solutions

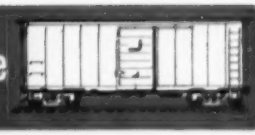


Get more N per dollar! There are three Phillips *66* Nitrogen Solutions for use in preparation of high-analysis fertilizers and the ammoniation of superphosphate. These solutions keep manufacturing costs low; help rapid, thorough curing.

4 Ammonium Nitrate

Phillips *66* Prilled Ammonium Nitrate contains 33.5% nitrogen. The small, coated prills resist caking, handle easily. Depend on Phillips *66* Prilled Ammonium Nitrate for free-flowing uniform properties and top-notch crop response as a direct application material. It's an ideal companion high nitrogen fertilizer for quality mixed goods.

5 Triple Superphosphate



Phillips *66* Triple Superphosphate contains 46% available phosphoric acid. Ideal for use in formulation of high-analysis fertilizers.

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